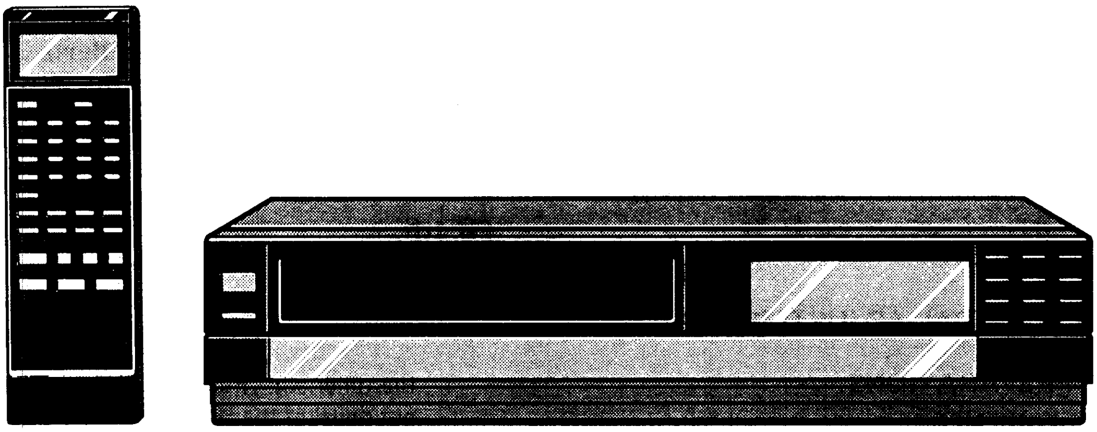
SERVICE MANUAL

SANYO

# VHR-3700 Series

## COLOUR VIDEO CASSETTE RECORDER

VHS PAL HQ Hi-Fi


VHR-3700G

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A11300 BP2HF SERIES

REFERENCE NO. WM-20892

## 1. LOCATION OF THE MAIN BOARDS

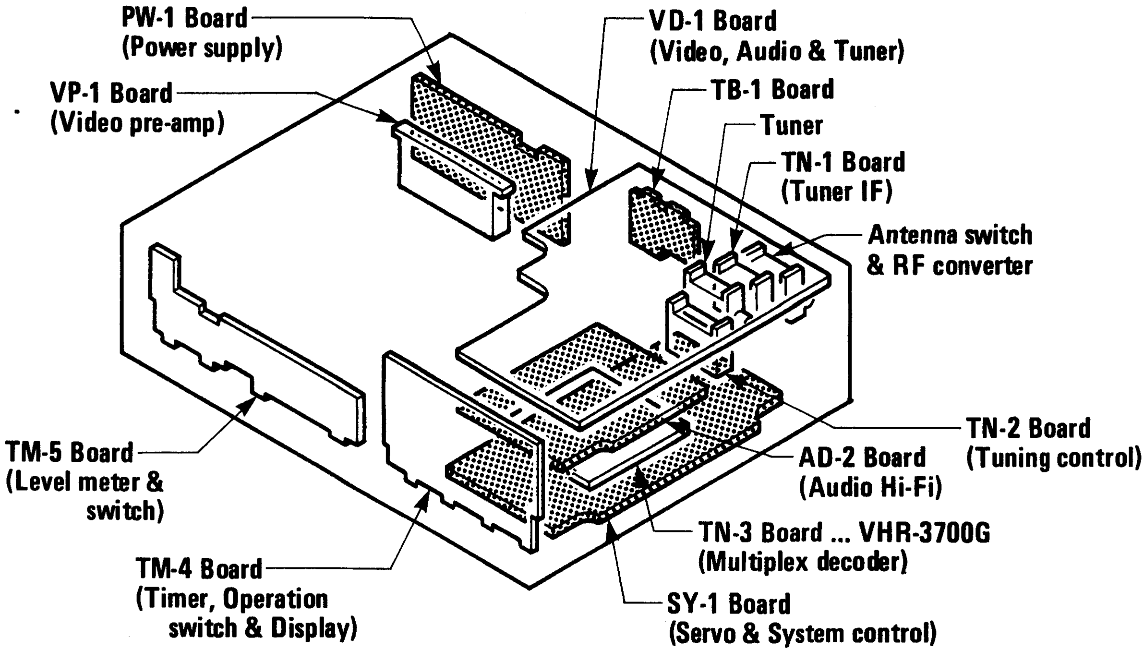

PW-1 Board
(Power supply)
VP-1 Board
(Video pre-amp)
VD-1 Board
(Video, Audio & Tuner)
TB-1 Board
Tuner
TN-1 Board
(Tuner IF)
Antenna switch
& RF converter
TN-2 Board
(Tuning control)
AD-2 Board
(Audio Hi-Fi)
TN-3 Board ... VHR-3700G
(Multiplex decoder)
SY-1 Board
(Servo & System control)
TM-5 Board
(Level meter &
switch)
TM-4 Board
(Timer, Operation
switch & Display)

Fig. 1-1

## 2. ELECTRICAL ADJUSTMENTS

### 2-1. PREPARATIONS

### 2-1-1. EQUIPMENT

- Colour TV monitor
- Colour-bar generator (with RF and LINE OUTPUT)
- Audio frequency oscillator
- Attenuator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- Alignment cassette (VHJ-0008) Colour bar 1KHz
- Alignment cassette (VHJ-0009) Monoscope 6KHz
- Alignment cassette (VHJ-0010) RF Sweep
- Alignment cassette (VHJ-0020)
  Colour-bar Normal 1KHz, Stereo 33% DEV 1KHz
- Alignment cassette (VHJ-0023) PAL Monoscope 6KHz, PAL Colour-bar 1KHz, SECAM Colour-bar 1KHz, PAL RF Sweep, MESECAM Colour-bar 1KHz, NTSC Colour-bar 1KHz.
- AC voltmeter
- In/output probes
- Audio MPX TV signal generator

### 2-1-2. SET-UP

Because the RF input signal is used for adjustment of circuits, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfy the items shown in figure. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3Vp-p.
- The amplitude of the video signal should be approximately 0.7Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

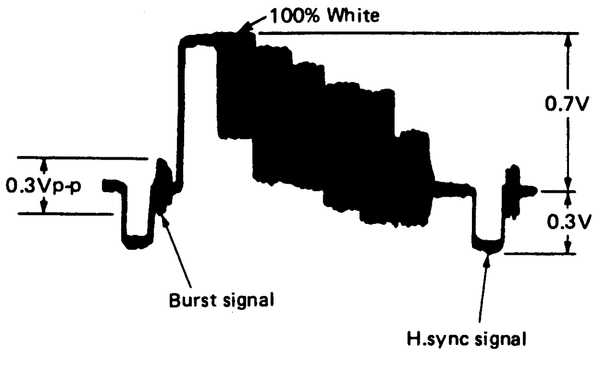
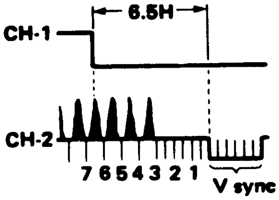
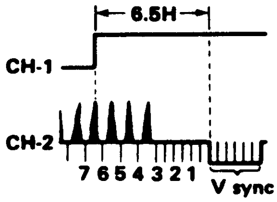
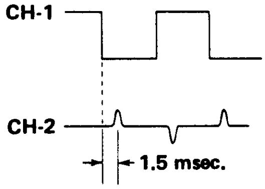


Fig. 2-1-1

## 2-2. SERVO CIRCUIT ADJUSTMENT ... SY-1 Board

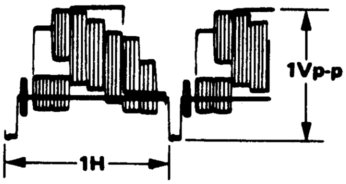
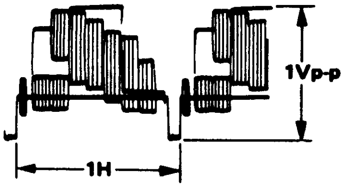
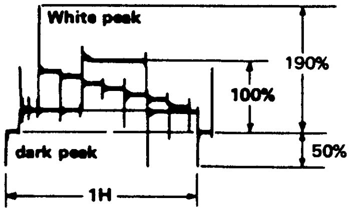
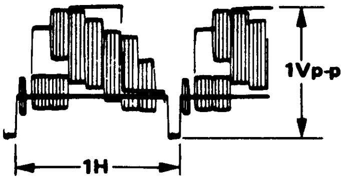
| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | CH-1 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4001 |  <br>Adjust SVR4001 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the fall of the CH-1 waveform. |
| 2 | CH-2 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4002 |  <br>Adjust SVR4002 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the rise of the CH-1 waveform. |
| 3 | TRACKING | Colour bar from Colour bar generator | REC<br>↓<br>PLAY | CN4008 ④<br>CN4008 ① (trigger) | SVR4003 |  <br>1. Playback the recorded portion, and set the tracking control to the center click position.<br>2. Adjust SVR4003 so that the phase of the CH-2 waveform is 1.5 ±0.5msec after the fall of the CH-1 waveform. In this instance, delay the CH-2 waveform. |
| 4 | STILL V-LOCK | Colour bar from Colour bar generator | REC<br>↓<br>PLAY<br>↓<br>STILL | TV screen | SVR4004 | 1. Playback the recorded part, and put the VCR in the STILL mode.<br>2. Adjust SVR4004 so that the V jitter (very fine movement of the vertical sync) is minimized. |

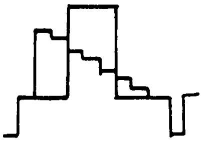
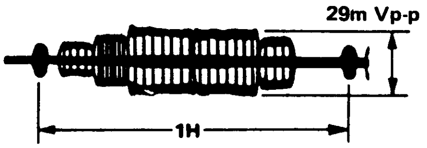
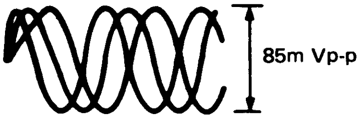
## 2-3. VIDEO CIRCUIT ADJUSTMENT ... VD-1 Board

NOTE (1): When adjusting No. 1, No. 2 and No. 5 terminate VIDEO OUTPUT terminal (CN1021 pin 19 or RCA terminal) at 75 ohms.

(2): To make this adjustment, alternately make the adjustments described in No. 4 and No. 5 below. Repeat this procedure until both adjustment values are satisfied.

(3): No-signal E-E mode is do not supply any signal to VIDEO INPUT terminal. (CN1021 ⑳ )

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | E-E LEVEL | Colour bar from Colour bar generator | E-E | TP1001 | SVR1007 |  <br>Adjust SVR1007 so that the level is 1.00 ±0.05 Vp-p. |
| 2 | PLAYBACK LEVEL | Alignment cassette (VHJ-0008 or VHJ-0023) | PLAY (Colour bar) | TP1001 | SVR1006 |  <br>Adjust SVR1006 so that the level is 1.00 ±0.05 Vp-p. |
| 3 | DARK CLIP AND WHITE CLIP | Colour bar from Colour bar generator | E-E | TP1002 (IC1001 ⑳ pin) | SVR1005 (DARK CLIP)<br>SVR1002 (WHITE CLIP) |  <br>1. Adjust SVR1005 so that the dark peak is 50 $^{+0}_{-5}$ %.<br>2. Adjust SVR1002 so that the white peak is 190 $^{+0}_{-5}$ %. |
| 4 | CARRIER SET | None NOTE (3) | E-E | TP1006 (CN1001) ⑥ | SVR1003 | 1. Set the TU/AV button to the AV position and but the VCR in the no-signal stop mode.<br>2. Adjust SVR1003 so that the frequency is 3.80 ±0.05 MHz. |
| 5 | DEVIATION | Colour bar from Colour bar generator | REC (Adjustment)<br>⬇<br>PLAY (Check) | TP1001 | SVR1004 |  <br>1. Playback the recorded part, and check that the level is 1.00 ±0.05Vp-p.<br>2. If the level is not 1.00 ±0.05Vp-p, adjust SVR1004, record and playback it until the value is satisfied. |

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 6 | VXO | Brank tape | PLAY | TP1007 | SVR1201 | Adjust SVR1201 so that the frequency is 4433619 ±20Hz. |
| 7 | CCD LEVEL | Colour bar from Colour bar generator | E-E | TP1003 (IC1001 ⑧pin)<br>TP1004 (IC1001 ⑨pin) | SVR1121 | <br>Adjust SVR1121 so that the same level of TP1003 and TP1004 waveforms. |
| 8 | CHRO-MINANCE SIGNAL RECORDING CURRENT | Colour bar from Colour bar generator | REC | CN1603③ (HOT)<br>CN1603① (GND) | SVR1202 | <br> <br>1. Turn SVR1001 all the way to the right, looking from the parts side.<br>2. Adjust SVR1202 so that the level is 29 ±2 m Vp-p. |
| 9 | LUMINANCE SIGNAL RECORDING CURRENT | B/W signal from Colour bar generator | REC | CN1603① (HOT)<br>CN1603③ (GND) | SVR1001 | <br> <br>Adjust SVR1001 so that the level is 85 $^{+0}_{-5}$ mVp-p. |

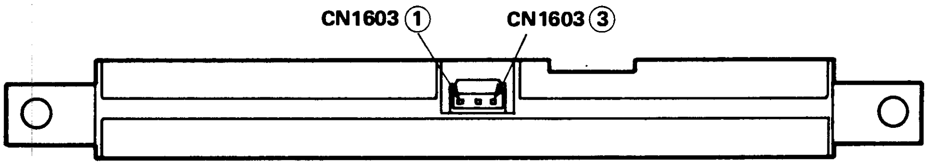


Fig. 2-3-1 VP-1 Board

## 2-4. AUDIO CIRCUIT ADJUSTMENT

(SETTING BEFORE ADJUSTMENT)

- The audio output terminal of the audio signal generator should be terminated at 600 ohms.
- The audio output terminal of the VCR should be terminated at 47 killo ohms (L ch and R ch).

## NORMAL AUDIO CIRCUIT ADJUSTMENT ... VD-1 Board

NOTE (1): No-signal record mode is do not supply any signal to the AUDIO INPUT terminal or CN1021② ⑥.

| No. | Item | Input | Mode | Test Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | BIAS | None | REC | TP2004<br>TP2005 (GND) | SVR2001 | 1. Set the TU/AV/SC button to the AV position and put the VCR in the no-signal record mode.<br>2. Adjust SVR2001 so that the level is 24mV rms. |

NOTE (2): Adjustment No. 2 is unnecessary for VHR-3700A and VHR-3700SP.
(3): Adjustment No. 3 is unnecessary for VHR-3700G, VHR-3700E and VHR-3700EX.

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 2 | PLAYBACK OUTPUT LEVEL NOTE (1) (2) | Audio signal (1 KHz, –3.8 dBs) from Audio signal generator | REC<br>⬇<br>PLAY | AUDIO OUT terminal | SVR2002 | Adjust SVR 2002 so that the recorded 1 KHz output level becomes –3.8 dBs in the PLAY mode. |
| 3 | PLAYBACK OUTPUT LEVEL NOTE (1) (3) | Audio signal (1 KHz, –7 dBs) from Audio signal generator | REC<br>⬇<br>PLAY | AUDIO OUT terminal | SVR2002 | Adjust SVR2002 so that the recorded 1 KHz output level becomes –7 dBs in the PLAY mode. |

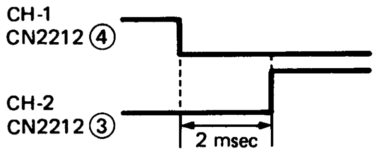
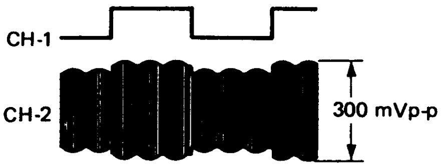
## AUDIO FM CIRCUIT ADJUSTMENT ... AD-2 Board

(SETTING BEFORE ADJUSTMENT)

- TU/AV/SC button . . . . . . . . . . . . . . . . . . . . . . . . . [SC] position
- TAPE SPEED select switch . . . . . . . . . . . . . . . . . . . . [SP] position
- TRACKING control . . . . . . . . . . . . . . . . . . . . . . . . . Center (click stop) position
- AUDIO select (STEREO/A/B) switch . . . . . . . . . . . . . [ST] position
- AUDIO select (NORMAL/Hi-Fi) switch . . . . . . . . . . . [Hi-Fi] position
- LEVEL METER select switch . . . . . . . . . . . . . . . . . . [AUDIO LEVEL] position
- AUDIO REC LEVEL control (L ch and R ch) . . . . . . . Center (click stop) position

NOTE (1): The AUDIO FM section adjustment has separate adjustment items for the L ch and R ch.
The R ch adjustments are included in parentheses.
(2): No-signal record mode is do not supply any signal to the audio in terminal.

| No. | Item | Input | Mode | Test Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | E-E AUDIO OUTPUT LEVEL | Audio signal (1KHz, –7dBm from Audio frequency oscillator | E-E | Audio output terminal | SVR2201 (L ch)<br>SVR2301 (R ch) | Adjust SVR2201 (SVR2301) so that the audio output level is –7dBs ± 0.5 dBs. |
| 2 | AUDIO LEVEL METER | Audio signal (1KHz, –7dBm) from Audio frequency oscillator | E-E | Audio output terminal | SVR2202 (L ch)<br>SVR2302 (R ch) | 1. Connect a jump wire between TP7001 and TP7002 (TM-5 Board).<br>2. Set the LEVEL METER select switch to the AUDIO LEVEL position.<br>3. Connect an audio frequency oscillator to the audio input terminals and set for an oscillation output of –7dBs 1KHz sine wave.<br>4. Connect an AC voltmeter to audio output terminals.<br>5. Set the AUDIO REC LEVEL control (L ch and R ch) so that the output level is –7dBs.<br>6. Adjust SVR2202 (SVR2302) so that the "–4dB" LEDs illuminate.<br>7. Set the audio REC LEVEL control (L ch and R ch) so that the VCR output level is –7.5dBm.<br>8. Adjust SVR2202 (SVR2302) so that the "–4dB" LEDs goes out.<br>9. Remove a jump wire from TM-5 Board. |

| No. | Item | Input | Mode | Test Point | Location | Remark |
|---|---|---|---|---|---|---|
| 3 | AF SWITCHING PULSE | Alignment cassette (VHJ-0022) | PLAY | CN2212③<br>CN2212④ (trigger) | SVR2402 |  Adjust SVR2303 so that the phase of the CH-2 waveform is 2 ±0.1 msec after the fall of the CH-1 waveform. In this instance, delay the CH-2 waveform. |
| 4 | AF CARRIER FREQUENCY | None | E-E | TP2201 (L ch)<br>TP2301 (R ch) | SVR 7 (L ch)<br>SVR 4 (R ch) | 1. Connect a frequency counter to TP2201 (TP2301).<br>2. Adjust SVR 7 (SVR 4) so that the carrier frequency is 1.4 MHz (1.8 MHz) ±5 KHz. |
| 5 | MUTE LEVEL | Alignment cassette (VHJ-0022) | PLAY | CN2212①<br>CN2212③ (trigger) | SVR 8 |  1. Set the tracking control to the best point.<br>2. Adjust SVR8 so that the level is 300 ±30 mVp-p. |
| 6 | PLAYBACK AUDIO OUTPUT LEVEL | Alignment cassette (VHJ-0022) | PLAY | Audio output terminal | SVR 6 (L ch)<br>SVR 3 (R ch) | Adjust SVR6 (SVR3) so that the playback audio output level is –7 ±1 dBs. |
| 7 | DEVIATION | Audio signal (1KHz, –7dBm from Audio frequency oscillator | REC<br>⬇<br>PLAY | Audio output terminal | SVR 2 (L ch)<br>SVR 1 (R ch) | 1. Connect an audio frequency oscillator to the audio input terminals, and set for an oscillation output of –7dBm 1KHz sine wave.<br>2. Connect an AC voltmeter to the audio output terminals.<br>3. Set the Audio REC LEVEL control (L ch and R ch) so that the VCR output level is –7dBs.<br>4. Adjust SVR2 (SVR 1) before recording, so that the VCR output level becomes –7 ±1.5dBs when playback. |

## 2-5. TUNER IF & MULTIPLEX DECODER CIRCUIT ADJUSTMENT ... TN-1, TN-3 & VD-1 Board.

NOTE: Adjustment No. 1 and No. 2 are unnecessary for VHR-3700A, E, EX and SP.

| No. | Item | Input | Mode | Test Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | STEREO SEPARATION | Audio signal (R ch ... 1KHz 100% mod. L ch ... 400Hz unmod.) from Audio MPX TV signal generator | E-E | TP6159 | SVR6080 (VD-1 Board) | 1. Set the pilot signal for the stereo mode. With the L ch unmodulated, provide 1KHz 100% modulation on the R ch.<br>2. Connect an osilloscope to TP6159 and adjust SVR6080 for minimum waveform peak-to-peak value. |
| 2 | H. OSC | No-signal | None | TP6157 | SVR6150 (TN-3 Board) | 1. Remove the TN-3 board from the chassis.<br>2. Connect the plus (+) side of an 12.0 ±0.1V DC power supply to CN6150 ④ and the minus (–) side to CN6150 ⑥ (GND).<br>3. Adjust SVR6150 so that the oscillation frequency is 15.5 ±0.1 KHz. |
| 3 | RF AGC | TV broadcast | E-E | TV screen | SVR 6001 | Turn SVR6001 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears. |

## 2-6. TEST POINT & ADJUSTMENT LOCATION

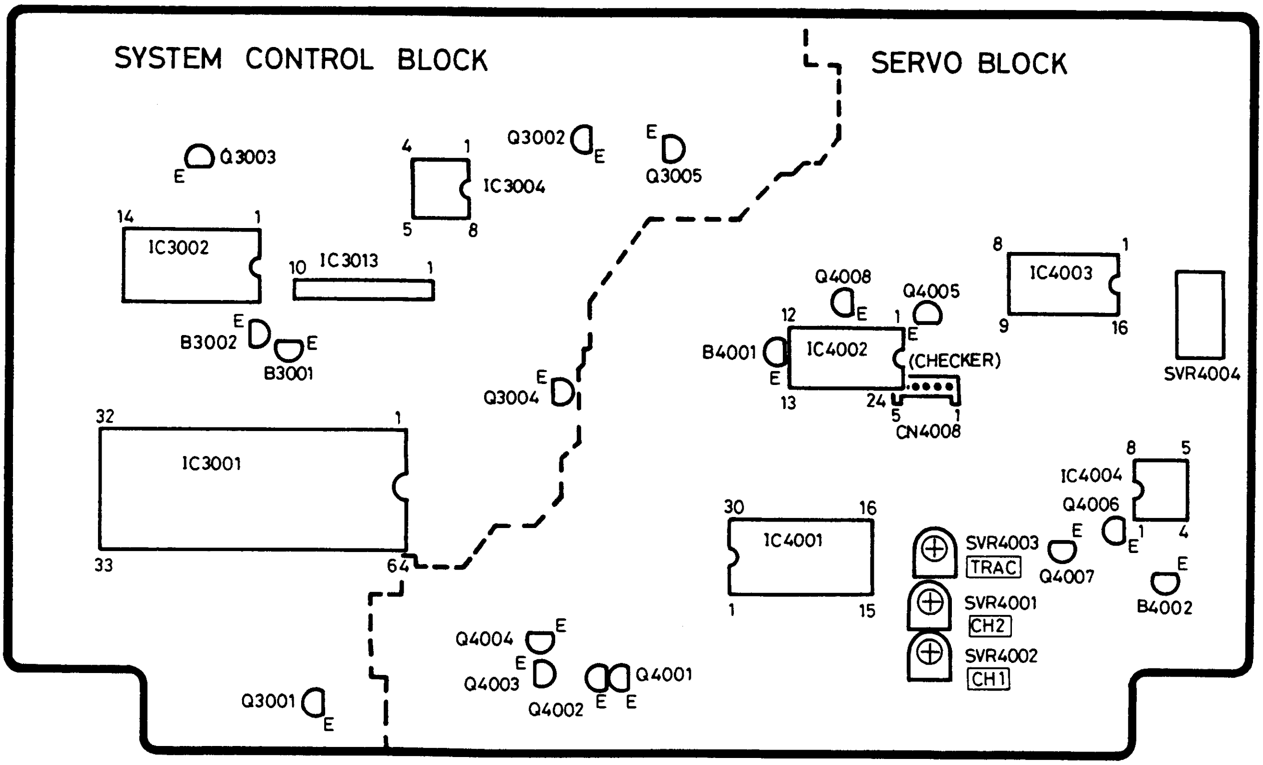

SYSTEM CONTROL BLOCK
SERVO BLOCK
Q3003
E
IC3004
4
1
5
8
Q3002
E
E
Q3005
14
1
IC3002
10
IC3013
1
B3002
E
E
B3001
Q3004
E
32
1
IC3001
33
64
Q4004
E
E
Q4003
Q4001
Q4002
E
E
Q3001
E
8
1
IC4003
9
16
Q4008
E
Q4005
12
1
E
B4001
E
IC4002
13
24
(CHECKER)
5
1
CN4008
SVR4004
8
5
IC4004
Q4006
E
1
4
E
30
16
IC4001
1
15
SVR4003
TRAC
Q4007
E
B4002
E
SVR4001
CH2
SVR4002
CH1

Fig. 2-6-1 SY-1 Board (Parts side view)

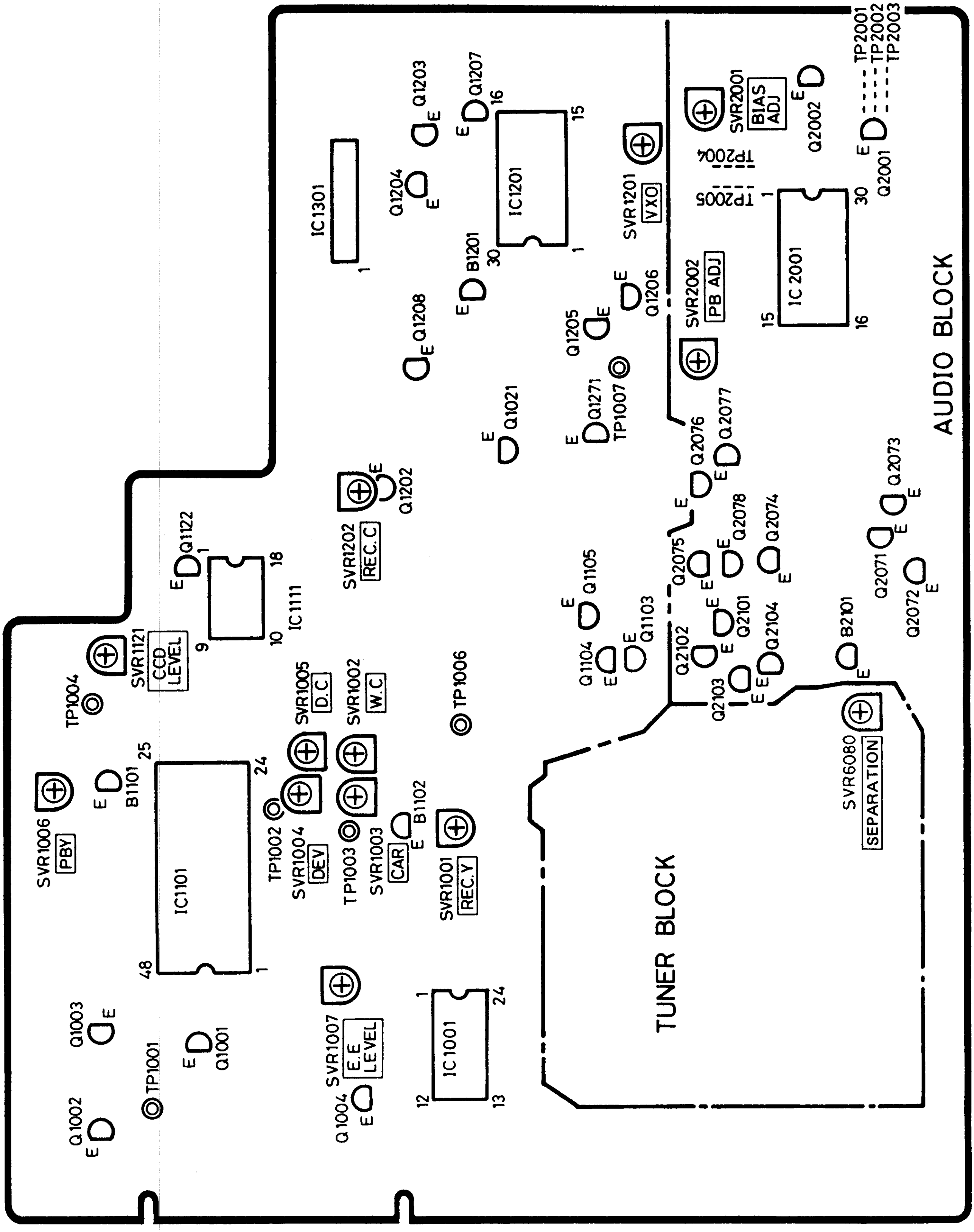

AUDIO BLOCK
TUNER BLOCK
TP2001
TP2002
TP2003
Q2001
Q2002
SVR2001
BIAS ADJ
TP2004
TP2005
IC 2001
SVR2002
PB ADJ
SVR1201
VXO
IC1201
IC1301
Q1203
Q1207
Q1204
B1201
Q1208
Q1206
Q1205
Q1021
Q1271
TP1007
Q2076
Q2077
Q2073
Q2071
Q2072
Q2078
Q2074
Q2075
Q2101
Q2104
Q2102
Q2103
B2101
Q1105
Q1103
Q1104
SVR6080
SEPARATION
SVR1202
REC.C
Q1202
Q1122
IC1111
SVR1121
CCD LEVEL
TP1004
SVR1005
D.C
SVR1002
W.C
TP1006
SVR1006
PBY
B1101
IC1101
TP1002
SVR1004
DEV
TP1003
SVR1003
CAR
B1102
SVR1001
REC.Y
SVR1007
E.E LEVEL
IC 1001
Q1003
Q1001
TP1001
Q1002
Q1004
E

Fig. 2-6-2 VD-1 Board (Parts side view)

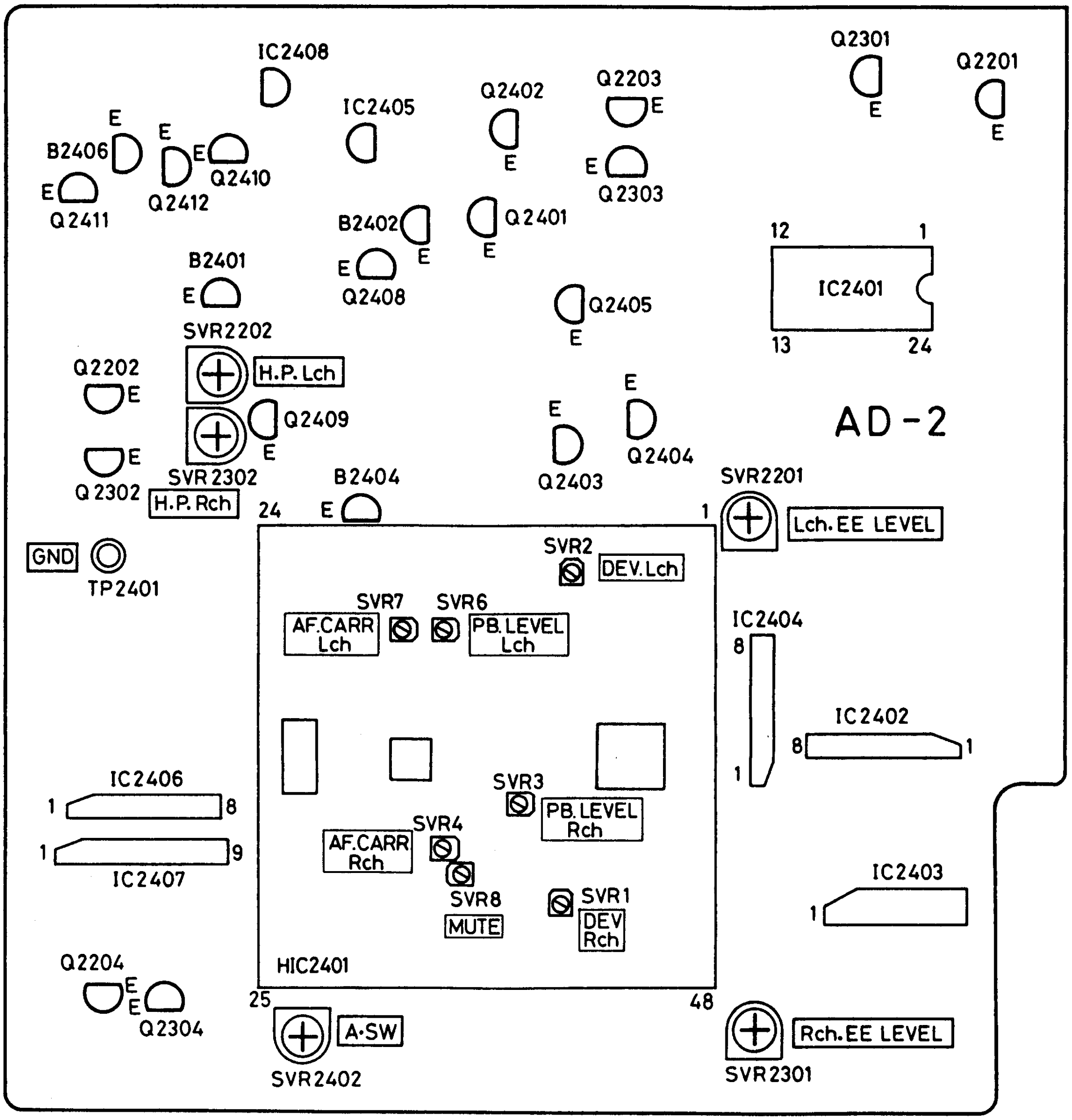

IC2408
Q2301
Q2201
IC2405
Q2402
Q2203
E
B2406
Q2410
Q2412
Q2411
Q2303
B2402
Q2401
12
1
IC2401
13
24
B2401
Q2408
Q2405
SVR2202
Q2202
H.P. Lch
Q2409
AD-2
Q2403
Q2404
Q2302
SVR2302
H.P. Rch
B2404
SVR2201
Lch.EE LEVEL
24
1
GND
TP2401
SVR2
DEV.Lch
SVR7
SVR6
AF.CARR Lch
PB.LEVEL Lch
IC2404
8
1
IC2402
8
1
IC2406
1
8
1
9
IC2407
SVR3
PB.LEVEL Rch
SVR4
AF.CARR Rch
SVR8
MUTE
SVR1
DEV Rch
IC2403
1
HIC2401
Q2204
Q2304
25
48
A·SW
SVR2402
Rch.EE LEVEL
SVR2301

**Fig. 2-6-3 AD-2 Board (Parts side view)**

**SANYO Electric Co., Ltd.**
OSAKA, JAPAN

July/'87/6000 HA
Printed in Japan

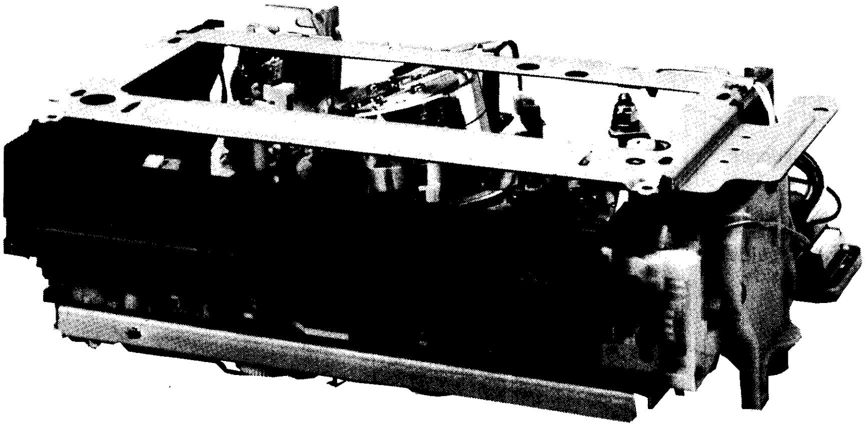
SERVICE MANUAL

SANYO

# VHR-3300, 3500, 3700, 3800 Series

# COLOUR VIDEO CASSETTE RECORDER

VHS PAL HQ



## MECHANISM DESCRIPTION AND MECHANISM ADJUSTMENT

("PL" Mechanism)

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BP Mechanism

REFERENCE No. WM-19932

# 1. MECHANISM DESCRIPTION

## 1-1. IDENTIFICATION AND LOCATION OF MECHANISM MAIN COMPONENTS

### (1) Mechanism Assembly (Top View)

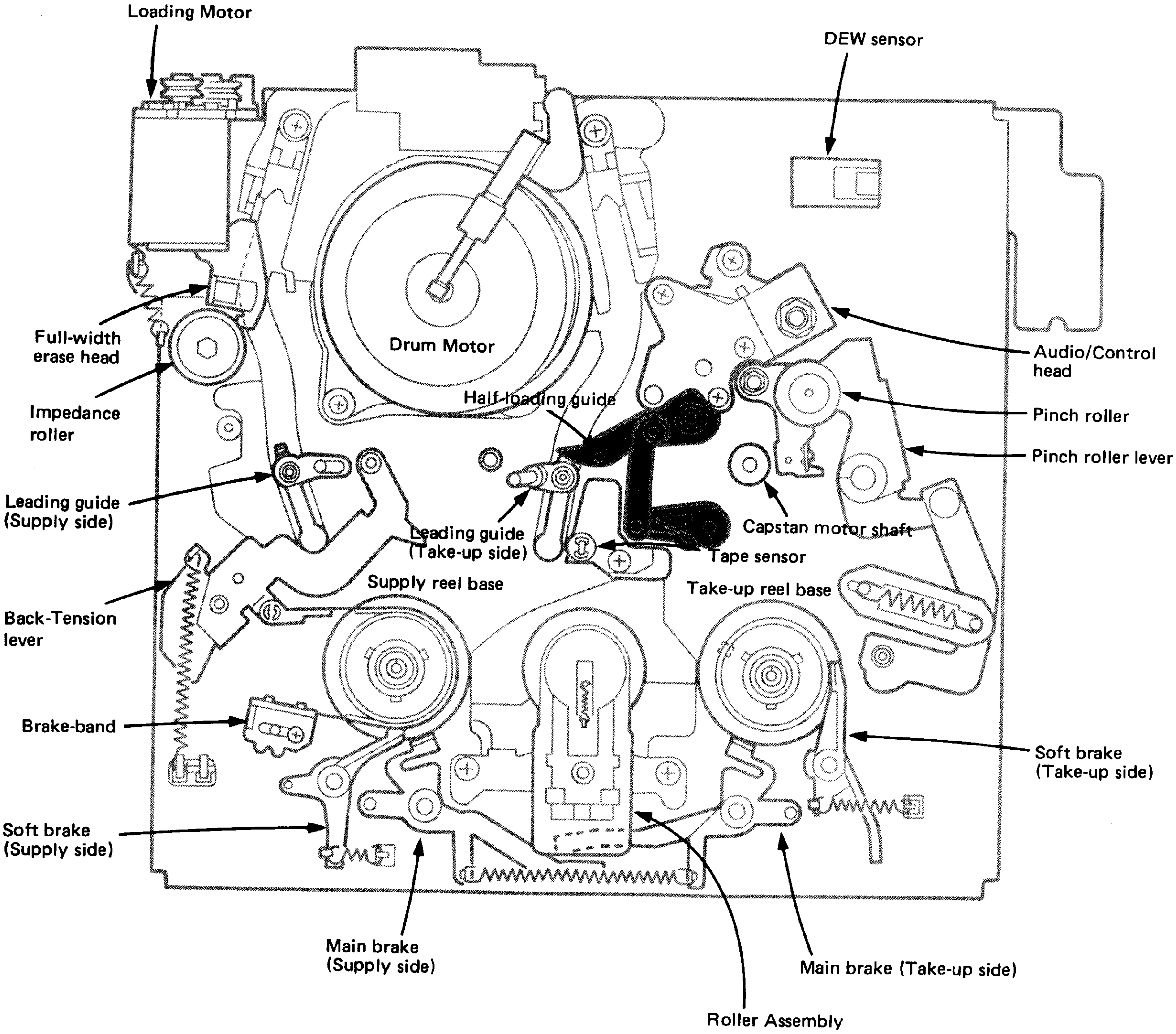
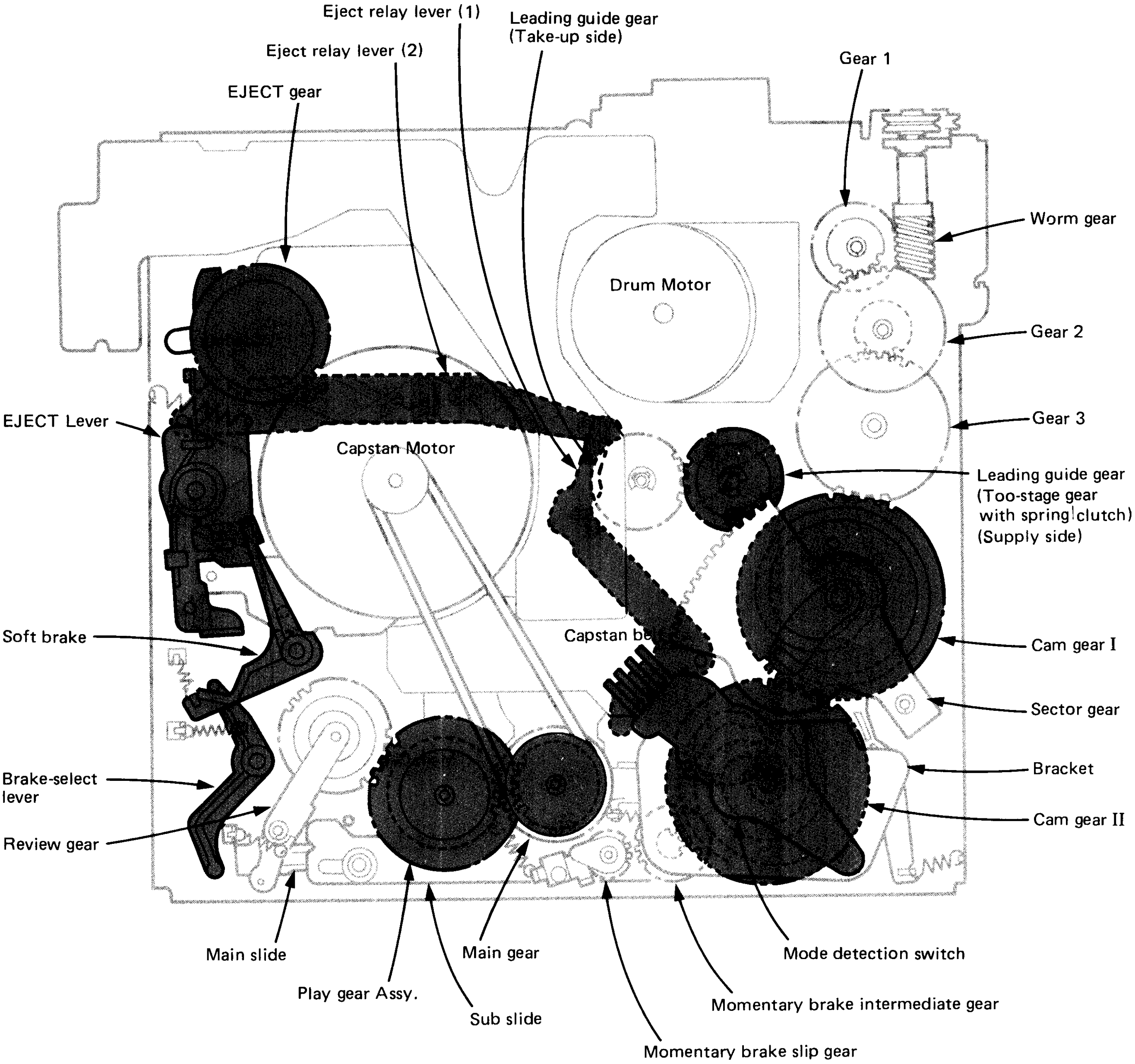

Loading Motor
DEW sensor
Full-width erase head
Impedance roller
Drum Motor
Half-loading guide
Audio/Control head
Pinch roller
Pinch roller lever
Leading guide (Supply side)
Leading guide (Take-up side)
Capstan motor shaft
Tape sensor
Supply reel base
Take-up reel base
Back-Tension lever
Brake-band
Soft brake (Take-up side)
Soft brake (Supply side)
Main brake (Supply side)
Main brake (Take-up side)
Roller Assembly

Fig. 1-1-1

## (2) Mechanism Assembly (Bottom View)



Eject relay lever (1)
Leading guide gear
(Take-up side)
Eject relay lever (2)
Gear 1
EJECT gear
Worm gear
Drum Motor
Gear 2
Gear 3
EJECT Lever
Capstan Motor
Leading guide gear
(Too-stage gear
with spring clutch)
(Supply side)
Soft brake
Capstan belt
Cam gear I
Sector gear
Bracket
Brake-select
lever
Cam gear II
Review gear
Main slide
Main gear
Mode detection switch
Play gear Assy.
Sub slide
Momentary brake intermediate gear
Momentary brake slip gear

Fig. 1-1-2

▨ main parts changed from model VHR-2100 series.

### (3) Front Loading Mechanism

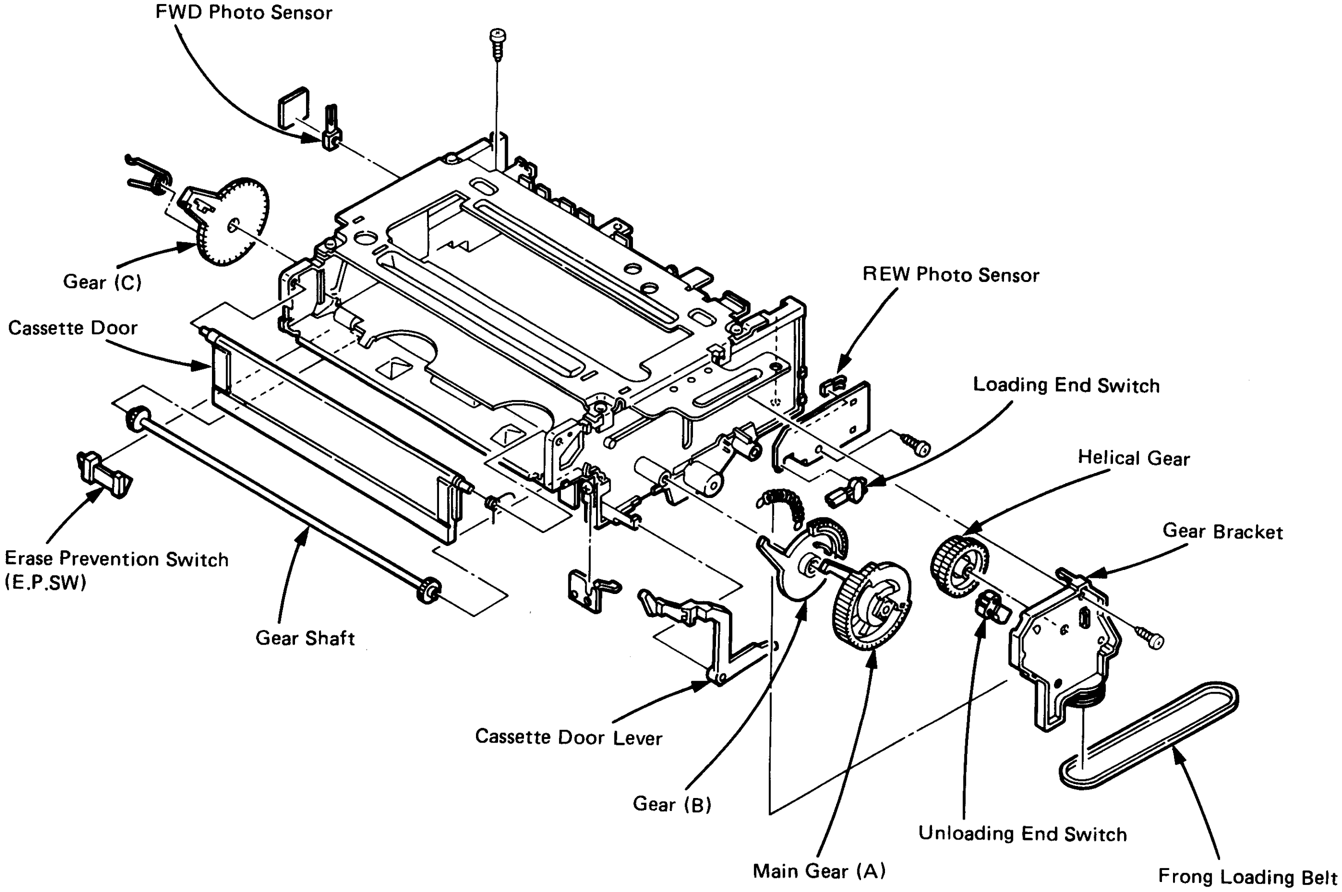

FWD Photo Sensor
Gear (C)
Cassette Door
REW Photo Sensor
Loading End Switch
Helical Gear
Gear Bracket
Erase Prevention Switch
(E.P.SW)
Gear Shaft
Cassette Door Lever
Gear (B)
Main Gear (A)
Unloading End Switch
Frong Loading Belt

Fig. 1-1-3

## 1-2. OUTLINE OF THE MECHANISM

The main differences between the machines of this unit and that of the previous model (VHR-2100) are the five described below.

Although the individual components are changed in form to some extent, their basic functions remain unchanged from those of the previous model.

- Main slip gear mechanism
- Cam gear mechanism
- Front-loading mechanism
- Capstan soft-braking mechanism
- Half-loading mechanism

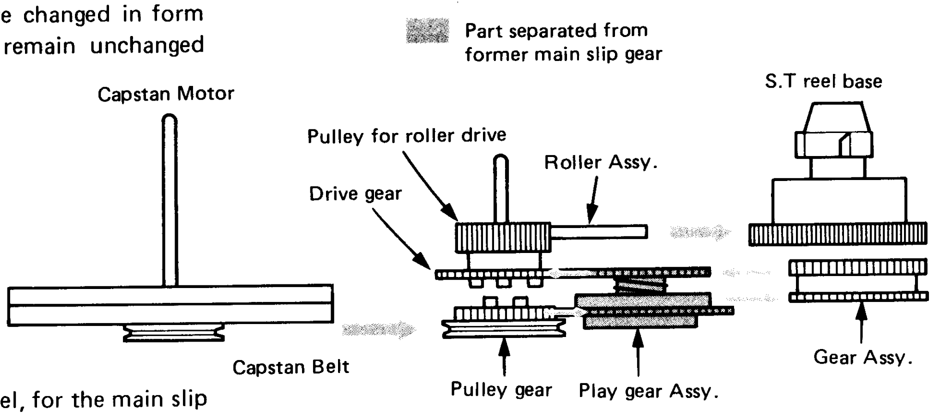


Fig. 1-2-1 Both reel base drive system

### 1-2-1. MAIN SLIP GEAR

In the mechanism for the previous model, for the main slip gear (which transfers the rotation of the capstan), the drive gear and pulley gear were on the same shaft.

For the mechanism (hereafter referred to as the "PL" mechanism) of this model, however, the drive gear and the pulley gear are on separate shafts.

- **Both-reel-base drive system**

For the PL mechanism, in the same way as for the mechanism of the previous model, the rotation of the capstan motor is transferred via the capstan belt to each gear, and rotational force is transferred from the roller assembly to both reel bases.

The roller assembly presses against either the supply reel base or the take-up reel base, depending upon the direction of rotation of the capstan motor.

Figure 1-2-1 shows the route of transfer of rotational force. The slip mechanism functions during playback, recording, forward search and slow motion playback. In other words, during these modes the drive gear is caused to rotate at the fixed torque by force, via the play gear assembly's slip mechanism, from the pulley gear.

During the fast-forward and rewind modes, the pulley gear and drive gear are locked, and, moreover, the engagement of the drive gear and the play gear assembly upper part is disengaged, and the pulley gear and drive gear rotate as one. During the reverse search mode, the reverse gear assembly meshes with the play gear assembly.

- **Main slip gear**

The main slip gear is composed of the pulley gear, the play gear assembly (which is always meshed with the pulley gear and which generates the playback torque), and the drive gear (which is on the same shaft as the pulley gear).

Figure 1-2-2 shows the normal (playback, record, forward & reverse search, slow, etc.) modes

When the capstan motor rotates in one of these modes, the pulley gear rotates, and, via the playback gear assembly, the drive gear rotates at a fixed torque.

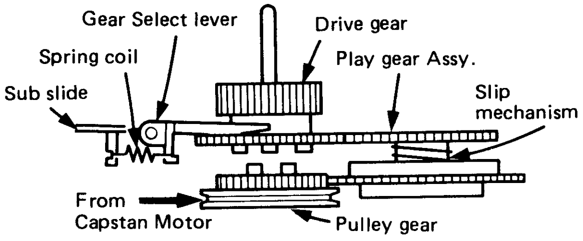


Fig. 1-2-2 Slip condition (PLAY. REC. F/R SEARCH, SLOW mode)

Figure 1-2-3 shows the gear conditions during the fast-forward and rewind modes.

As a result of the movement of cam gear II, the sub slide, interlocked with the main slide, moves in the direction of the arrow (A).

Consequently, the spring coil (located between the sub slide and the gear-switching lever) causes the gear-switching lever to turn in the clockwise direction (B) in the illustration.

When this happens, the end of the gear-switching lever presses the drive gear downward (in the direction of the (C) arrow), thus disengaging the engagement with the playback gear assembly.

In addition, as a result of the engagement of the "tab" at the lower part of the drive gear and the "tab" at the top part of the pulley gear, the pulley gear and drive gear become locked, and rotate unified as one. The result, in other words, is that there is no slippage.

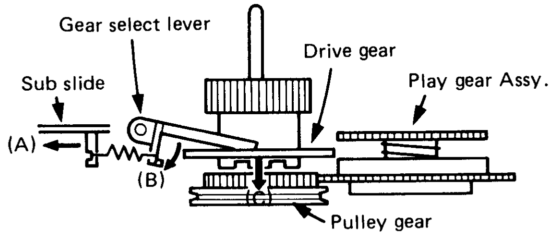


Fig. 1-2-3 Lock condition (F-FWD, REW modes)

### 1-2-2. CAM GEARS

The PL mechanism of this unit is equipped with two cam gears.

Cam gear I has mechanism driving cam slots at the front and back; and cam gear II is provided at the front with a gear to rotate the mechanism operating mode detector switch and has a mechanism driving cam slot at the back.

(1) Action of the cam slot at the front of cam gear.

Figure 1-2-4 shows the action of cam gear I as viewed from the back of the PL mechanism. The function of the cam slot at the front (as viewed from the back of the PL mechanism) of the cam gear is to load or unload the tape leading guide through the sector gear and leading guide gear. The PL mechanism, whose S-side leading guide gear is a two-stage gear with spring clutch mechanism, allows the sector gear to move leftward beyond the STOP position. This movement of the sector gear drives the eject lever to mesh the eject gear and the peripheral gear of the capstan motor, resulting in front loading or unloading of the cassette tape being achieved.

On the other hand, the gear at the front of cam gear II functions to rotate the mechanism operating mode detector switch (rotary switch). The important point for the action of the PL mechanism is where the mode detector switch, cam gear II, cam gear I, and S-side and T-side leading guide gears should mesh each other when the unit is stopped. When removing or mounting the gears and mode detector switch, refer to the gear/mode detector switch installation and adjustment section given later.

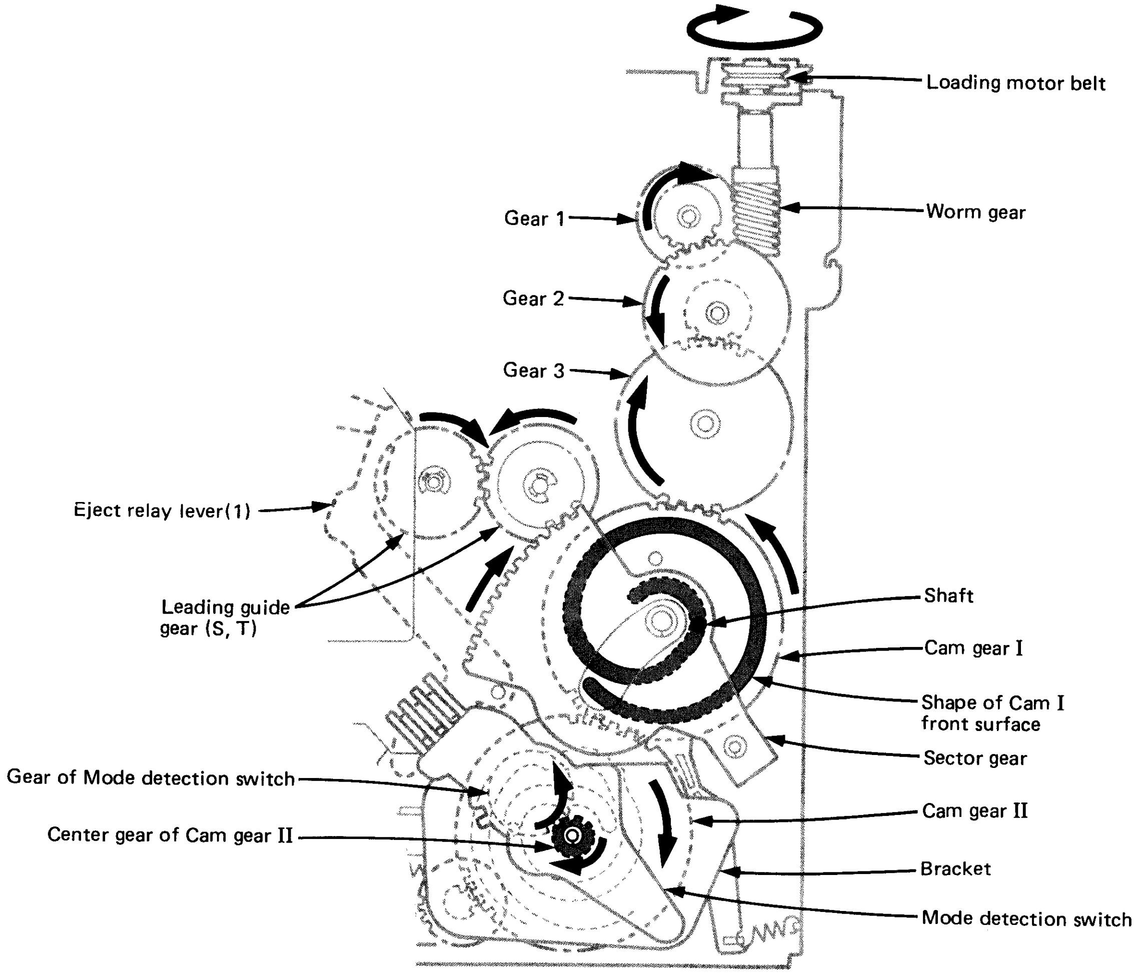
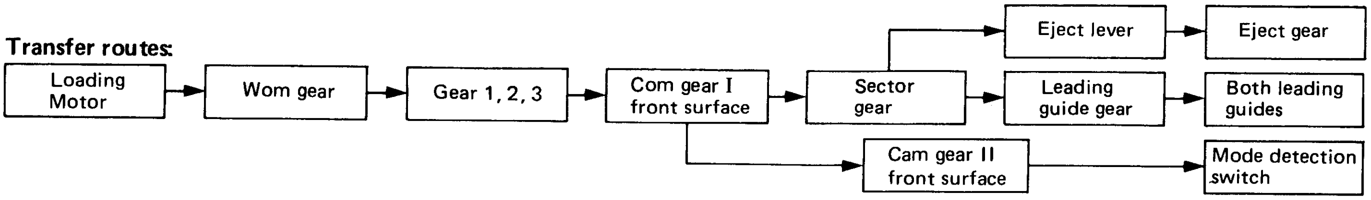

Loading motor belt
Worm gear
Gear 1
Gear 2
Gear 3
Eject relay lever(1)
Leading guide gear (S, T)
Shaft
Cam gear I
Shape of Cam I front surface
Sector gear
Gear of Mode detection switch
Center gear of Cam gear II
Cam gear II
Bracket
Mode detection switch

Fig. 1-2-4 Cam surface movement

**Transfer routes:**


Loading Motor
Wom gear
Gear 1, 2, 3
Com gear I front surface
Sector gear
Eject lever
Eject gear
Leading guide gear
Both leading guides
Cam gear II front surface
Mode detection switch

(2) Action of the cam slot at the back of cam gear.

The pinch roller pressing slide lever moves to the right and left according to the shape of the cam slot at the back of cam gear I. The pinch roller pressing operation is controlled by the pinch roller shaft 1 on the slide lever. Shaft 2, which functions to move the slide lever to the right and left, also controls the movement of the back tension lever. The half-loading state, in which the tape is always in contact with the control head, is achieved by the pinch roller pressing slide lever and half-loading lever shaft except when the unit is in the EJECT mode. Half-loading is a tape running state that is important for the linear time counter and for a program search operation on the VISS/VASS system those operates based on detected control signals.

The main slide lever is moved to the right and left by shaft 3 of the main slide lever along the cam slot at the back of cam gear II. The pressing operations of both the S-side and T-side main brakes are controlled by the main slide lever, take-up brake shaft 4, and supply brake shaft 5.

When the unit is in the SLOW, STILL, or F.ADV mode, the brake select lever is pushed by the main slide lever, causing the capstan soft brake to accomplish soft braking essential for intermittent driving of the capstan motor.

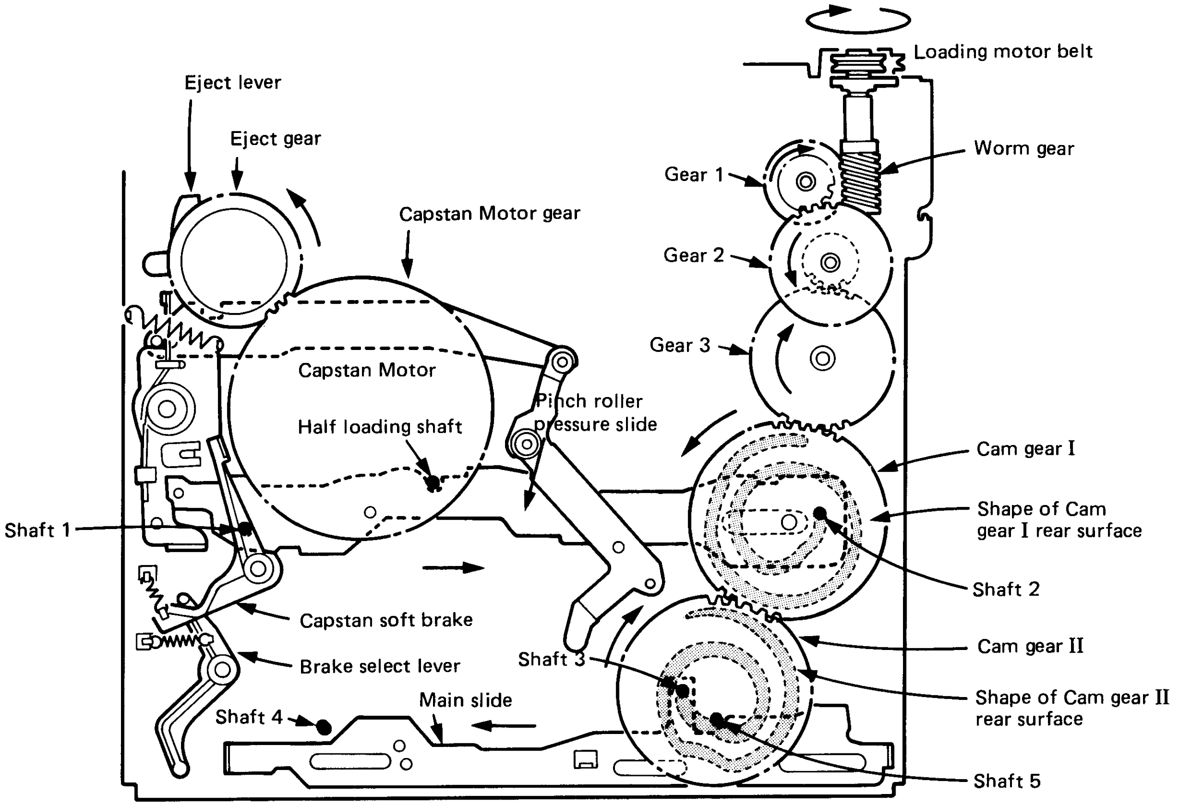
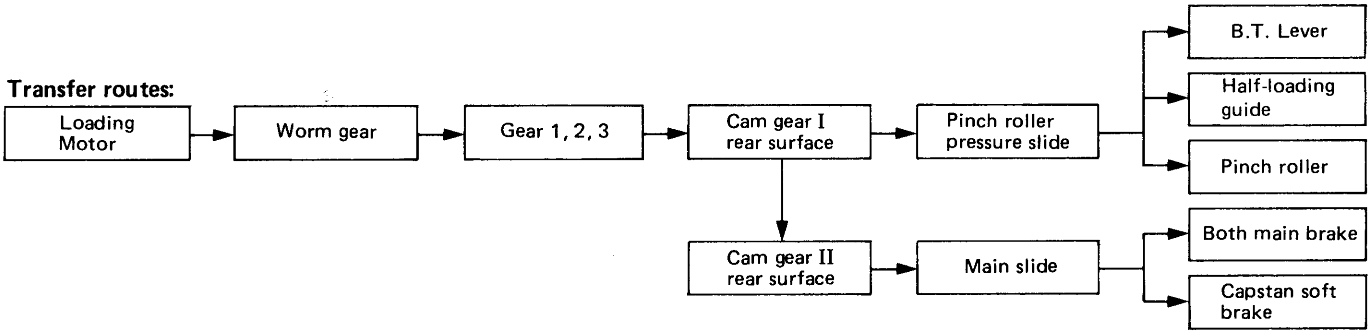

Loading motor belt
Eject lever
Eject gear
Worm gear
Gear 1
Capstan Motor gear
Gear 2
Gear 3
Capstan Motor
Pinch roller pressure slide
Half loading shaft
Cam gear I
Shape of Cam gear I rear surface
Shaft 1
Shaft 2
Capstan soft brake
Cam gear II
Brake select lever
Shaft 3
Shape of Cam gear II rear surface
Main slide
Shaft 4
Shaft 5

Fig. 1-2-5 Cam rear movement (Mechanism Bottom)

**Transfer routes:**


B.T. Lever
Loading Motor
Worm gear
Gear 1, 2, 3
Cam gear I rear surface
Pinch roller pressure slide
Half-loading guide
Pinch roller
Cam gear II rear surface
Main slide
Both main brake
Capstan soft brake

### 1-2-3. DRIVING OF THE FRONT-LOADING MECHANISM BY THE CAPSTAN MOTOR

Figure 1-2-6 shows the eject mechanism. Since the S-side leading guide gear is a two-stage gear with spring clutch mechanism as described in 1-2-2, the sector gear can be further moved from the STOP position to the EJECT position by cam gear I. When the sector gear moves to the left (to the EJECT position), it pushes shaft (A), causing shaft (B) to pull coil spring (a) of the eject lever through eject relay levers 1 and 2. This action causes the eject gear and the peripheral gear of the capstan motor to mesh each other, rotating the drive pulley on the front-loading mechanism side through the belt. Front loading (tape loading) or unloading (ejection) of the cassette tape is performed according to the rotating direction of the capstan motor. When the unit is in any mode other than the front loading (tape loading) and unloading (ejection) modes, the sector gear is out of contact with shaft (A), and thus the eject gear and the peripheral gear of the capstan motor are kept disengaged from each other by the tension of spring (b). At this time shaft (C) of the pinch roller pressing slide lever serves to prevent the eject gear from touching the peripheral gear of capstan motor.

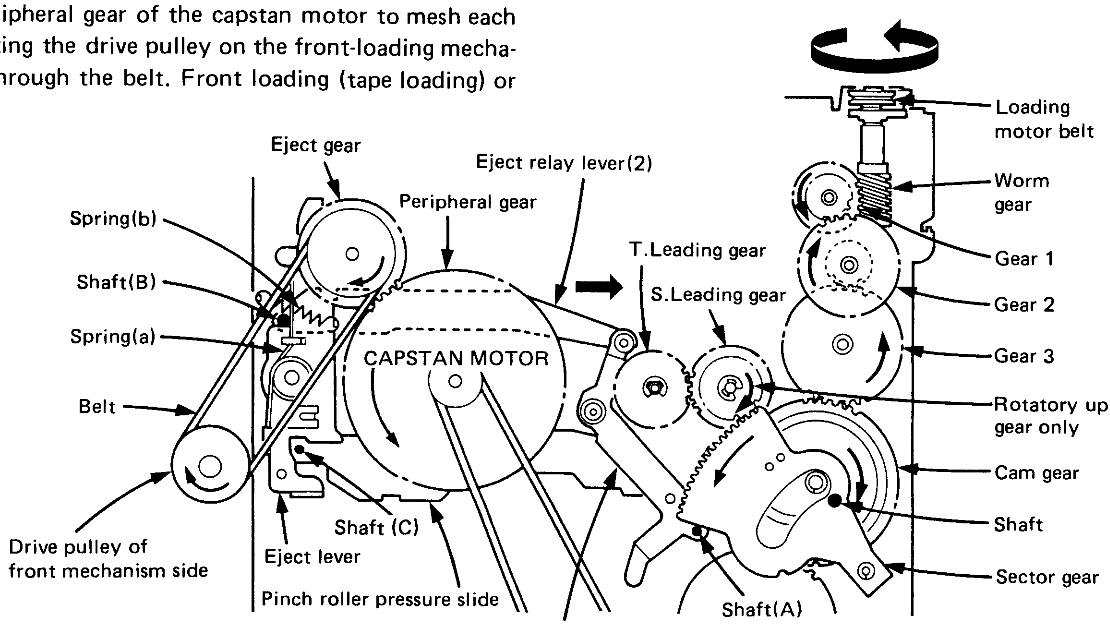

Loading motor belt
Eject gear
Eject relay lever(2)
Spring(b)
Peripheral gear
Worm gear
T.Leading gear
Shaft(B)
S.Leading gear
Gear 1
Gear 2
Spring(a)
CAPSTAN MOTOR
Gear 3
Belt
Rotatory up-side gear only
Cam gear
Shaft
Drive pulley of front mechanism side
Shaft (C)
Eject lever
Sector gear
Pinch roller pressure slide
Shaft(A)
Eject relay lever(1)

Fig. 1-2-6

### 1-2-4 CAPSTAN "SOFT BRAKE"

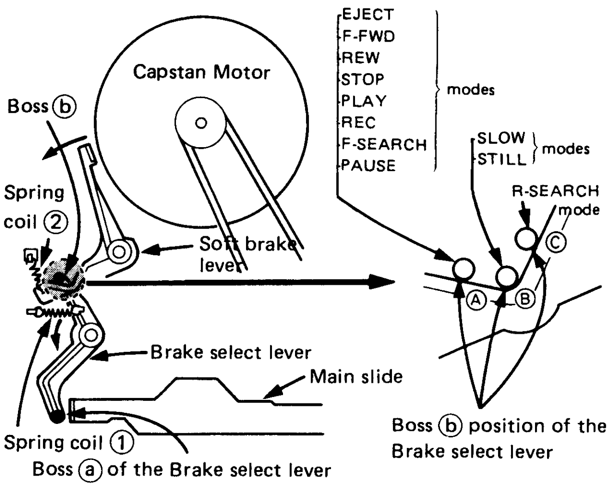

EJECT
F-FWD
REW
STOP
PLAY
REC
F-SEARCH
PAUSE
modes
SLOW
STILL
modes
R-SEARCH mode
Capstan Motor
Boss ⓑ
Spring coil ②
Soft brake lever
Ⓐ
Ⓑ
Ⓒ
Brake select lever
Main slide
Spring coil ①
Boss ⓐ of the Brake select lever
Boss ⓑ position of the Brake select lever

Fig. 1-2-7

The capstan "soft brake" is activated only during the slow, still and fast-advance modes.

For the eject, fast-forward, rewind, stop, playback, record, forward search and pause modes, the main slide is farthest to the right, and the boss a of the brake select lever and the left edge of the main slide are separated.

In other words, the brake select lever is pulled by the spring coil ①, causing it to contact the left side of the "soft brake" cam; the "soft brake" then rotates in the counterclockwise direction and moves away from the outer circumference of the capstan.

When there is a change from the playback mode to the slow, still or fast-advance mode, the main slide moves toward the left.

When the left edge of the main slide presses against the brake select lever's boss a , the brake select lever moves in the clockwise direction.

As a result of this movement, the point at which the brake select lever's boss b contacts the cam part of the "soft brake" moves from Ⓐ to Ⓑ.

The "soft brake" lever then rotates in the clockwise direction as a result of the force exerted by the spring coil ②, and the brake shoe part at the end of the "soft brake" lever is pressed tightly against the outer circumference of the capstan motor, thus applying the braking force.

During the reverse search mode, the main slide moves even farther to the left, and, because the brake-switching lever is caused to rotate in the clockwise direction, the position of the brake select lever's boss b moves from position Ⓑ to position Ⓒ.

As a result, the "soft brake" lever moves in the counterclockwise direction, and the brake shoe at the end of the "soft brake" moves away from the outer circumference of the capstan motor, thus releasing the braking force.

### 1-2-5.HALF-LOADING MECHANISM

This unit is equipped with the linear time counter and High-Speed Index Search System (VISS/VASS) that always operate based on detected control signals in every mode including REW/F. FWD. Accordingly, the unit uses the half-loading mechanism that enables the tape to always contact the control (A/C) head for detecting control signals even in the REW/F. FWD and STOP modes as shown in Fig. 1-2-8.

As shown in Fig. 1-2-9 the half-loading lever assembly consists of three levers linked together. The half-loading lever shaft is always pressed against the pinch roller pressing slide lever by spring (a). The slide lever is situated on the back of the half-loading mechanism and is moved to the right and left along the above-mentioned cam slot at the back of cam gear I. Figure 1-2-9 shows in what state the slide lever and half-loading lever are when the unit is in the EJECT mode. When the unit is loaded with a cassette tape and enters the STOP mode, the pinch roller pressing slide lever moves to the left to raise the half-loading lever shaft according to the shape of the lever, putting the unit in the tape half-loading state shown in Fig. 1-2-8. When the tape is normally run in the leading guide as in the PLAY or R/F SEARCH mode, the half-loading lever is returned a little by the pinch-roller pressing slide lever, preventing the half-loading guide from touching the tape for protecting it.

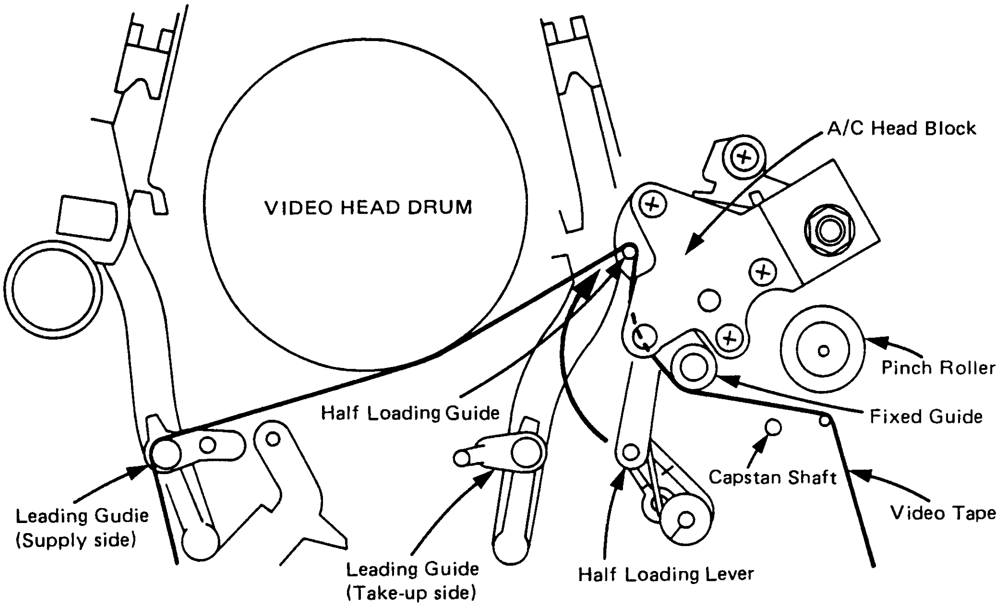

A/C Head Block
VIDEO HEAD DRUM
Pinch Roller
Fixed Guide
Half Loading Guide
Capstan Shaft
Video Tape
Leading Gudie
(Supply side)
Leading Guide
(Take-up side)
Half Loading Lever

Fig. 1-2-8

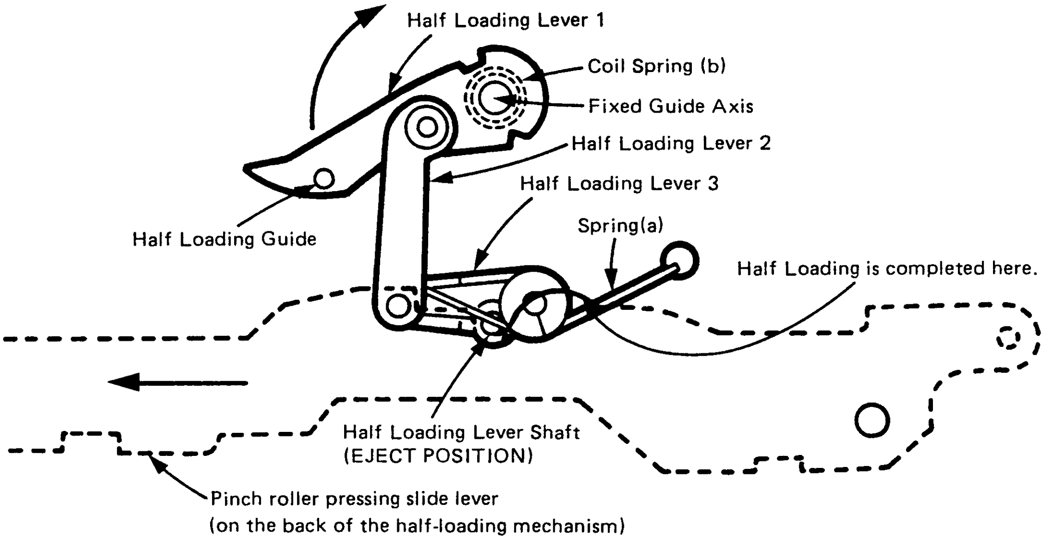

Half Loading Lever 1
Coil Spring (b)
Fixed Guide Axis
Half Loading Lever 2
Half Loading Lever 3
Half Loading Guide
Spring(a)
Half Loading is completed here.
Half Loading Lever Shaft
(EJECT POSITION)
Pinch roller pressing slide lever
(on the back of the half-loading mechanism)

Fig. 1-2-9

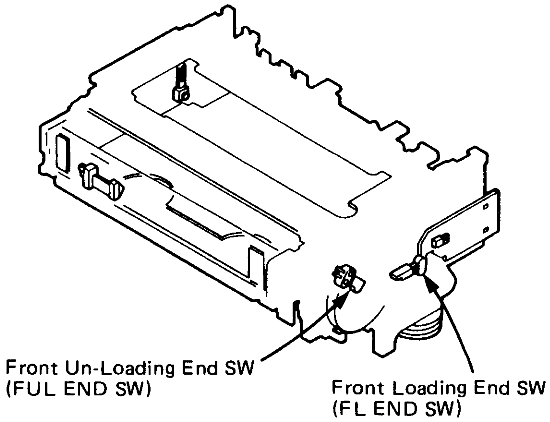
## 1-3. MECHANISM OPERATION IN EACH MODE

The movement of the mechanism in each mode is basically unchanged from that of previous models.

In this section, timing charts are used to present the movement of the motor and brake components during seven modes.

(1) Cassette insertion
(2) Changing from the stop mode to the playback mode
(3) Changing from the playback mode to the reverse-search mode
(4) Changing from the record mode to the pause mode
(5) Changing from the playback mode to the stop mode
(6) Changing from the stop mode to the fast-forward mode
(7) Changing from the stop mode to the rewind mode
(8) Changing from the stop mode to the eject mode

### 1-3-1. ILLUSTRATIONS OF THE ARRANGEMENT OF THE MOTOR AND BRAKE COMPONENTS ARE SHOWN IN Figs. 1-3-1 and 1-3-2


Front Un-Loading End SW
(FUL END SW)
Front Loading End SW
(FL END SW)

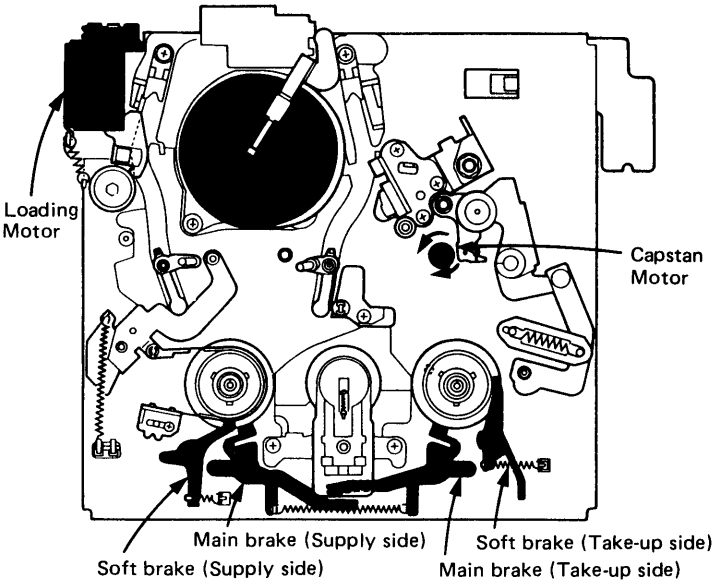
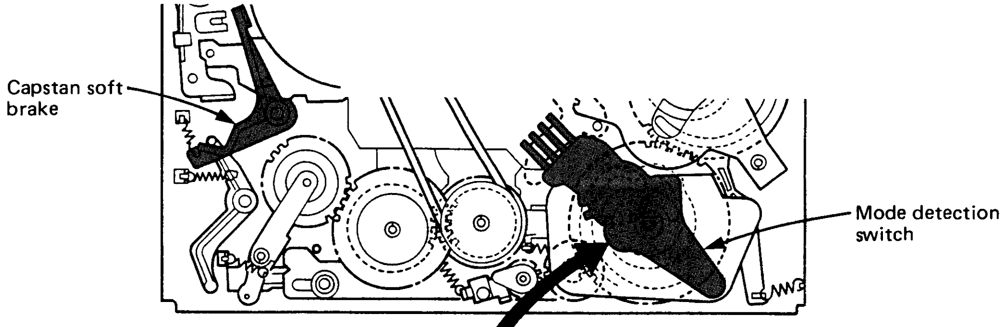
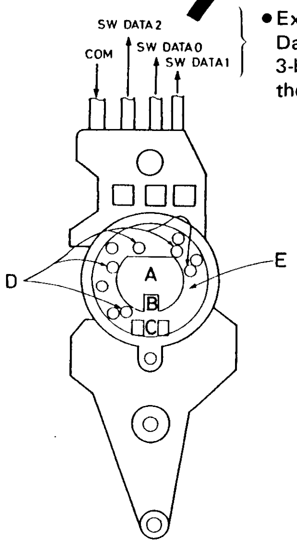

Loading Motor
Capstan Motor
Main brake (Supply side)
Soft brake (Supply side)
Soft brake (Take-up side)
Main brake (Take-up side)

Fig. 1-3-1 (Mechanism Top)


Capstan soft brake
Mode detection switch


SW DATA2
COM
SW DATA0
SW DATA1
D
E
A
B
C

- External view of the mechanism mode detector switch
  Data output from the mode detector switch
  3-bit data that corresponds to the mechanism mode is outputted to the system control MPU.

**Part E (appearance of the rotary switch)**
The mode detector switch acts in synchronization with the movement of cam gear II. When cam gear II rotates, part (A) also rotates. The rotary switch (E) has ten protuberances (D) and the protuberance (C) for the alignment of the STOP position. It can be judged by the positions of these protuberances and the notch (B) of the rotating part (A) what mode the mechanism is in. In the illustration at the left parts (B) and (C) are in alignment, indicating that the mechanism is in the STOP mode. The enlarged view of part E shown in Fig. 1-3-3 shows in what position the mechanism mode detector switch is in respective modes.

Fig. 1-3-2 (Mechanism Bottom)

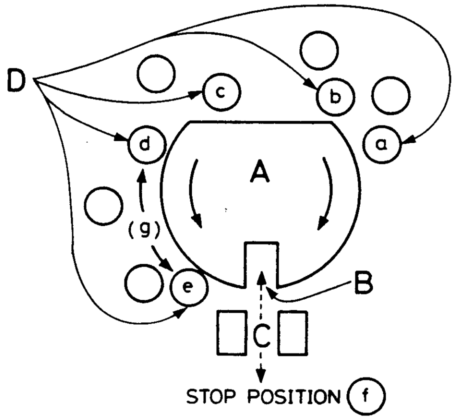
### 1-3-2. MECHANISM OPERATION IN EACH MODE (Table 1-3-1)

| Parts Name / Mode | Loading Motor | Capstain Motor | Drum Motor | Main brake | | Soft brake | | Capstain motor Soft brake | Mode detection SW DATA (3bit HEX. DATA) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | S | T | S | T | | |
| CASSETTE IN | OFF | ON (C.C.W) | OFF | OFF | ON | OFF | ON | OFF | ① |
| HALF LOADING | ON (C.C.W) | OFF | OFF | OFF | ON | OFF | ON | OFF | ⑦ |
| STOP | OFF | OFF | OFF | OFF | ON | ON | ON | OFF | ③ |
| LOADING | ON (C.C.W) | ON→OFF (C.W.) | ON | OFF | ON | ON | ON | OFF | ③→④ |
| UN-LOADING | ON (C.W) | ON (C.C.W) | ON (C.C.W→OFF) | OFF | ON | ON | ON | OFF | ④→③ |
| PLAY/REC | OFF | ON (C.W) | ON | OFF | OFF | OFF | ON | OFF | ④ |
| F-SEARCH | OFF | ON (C.W) | ON | OFF | OFF | OFF | ON | OFF | ④ |
| R-SEARCH | OFF | ON (C.C.W) | ON | OFF | OFF | OFF | ON | OFF | ⑥ |
| STILL | OFF | OFF | ON | OFF | OFF | OFF | ON | ON | ⑤ |
| SLOW, F-ADV | OFF | ON (C.W) | ON | OFF | OFF | OFF | ON | ON | ⑤ |
| F FWD | OFF | ON (C.W) | ON | OFF | OFF | OFF | ON | OFF | ② |
| REW | OFF | ON (C.W) | ON | OFF | OFF | OFF | ON | OFF | ② |
| PAUSE | OFF | OFF | ON | OFF | OFF | OFF | ON | OFF | ④ |
| HALF UN-LOADING | ON (C.W) | ON (C.C.W) | OFF | OFF | ON | OFF | ON | OFF | ⑦ |
| EJECT | OFF | ON (C.W) | OFF | OFF | ON | OFF | ON | OFF | ① |

Table 1-3-1

Note:
1. CW: clockwise direction
   CCW: counterclockwise direction
   The rotation of the capstan, drum and each motor is as seen from the chassis surface (top); the rotation of the loading motor is as seen from the front of the unit.
2. ON/OFF condition of brakes:
   ON: when brake is applied
   OFF: when brake is not applied

**Enlarged view of part E of the mechanism mode detector switch**



Relations between respective modes and the mode switch positions as well as mode switch data output

| MODE SW / MODE | SW POSITION | 3bit SW DATA | | | |
|---|---|---|---|---|---|
| | | DATA 2 | DATA 1 | DATA 0 | HEX DATA |
| EJECT | d | 0 | 0 | 1 | ① |
| F · FWD/REW | e | 0 | 1 | 0 | ② |
| STOP | f | 0 | 1 | 1 | ③ |
| PLAY/REC<br>F . SEARCH | a | 1 | 0 | 0 | ④ |
| SLOW/STILL | b | 1 | 0 | 1 | ⑤ |
| R · SEARCH | c | 1 | 1 | 0 | ⑥ |
| HALF-LOADING | (g) | 1 | 1 | 1 | ⑦ |

Fig. 1-3-3

### 1-3-3. TIMING CHARTS FOR SEFVEN MAIN MODES

The mechanism operation for each mode as time passes is shown in the following charts.

- The rotation direction of the drum motor and capstan motor is as seen from above the mechanism.
- The rotation direction of the loading motor is as seen from the front of the unit.
- ON/OFF condition of brakes:
  ON: when brake is applied
  OFF: when brake is not applied

### (1) CASSETTE IN

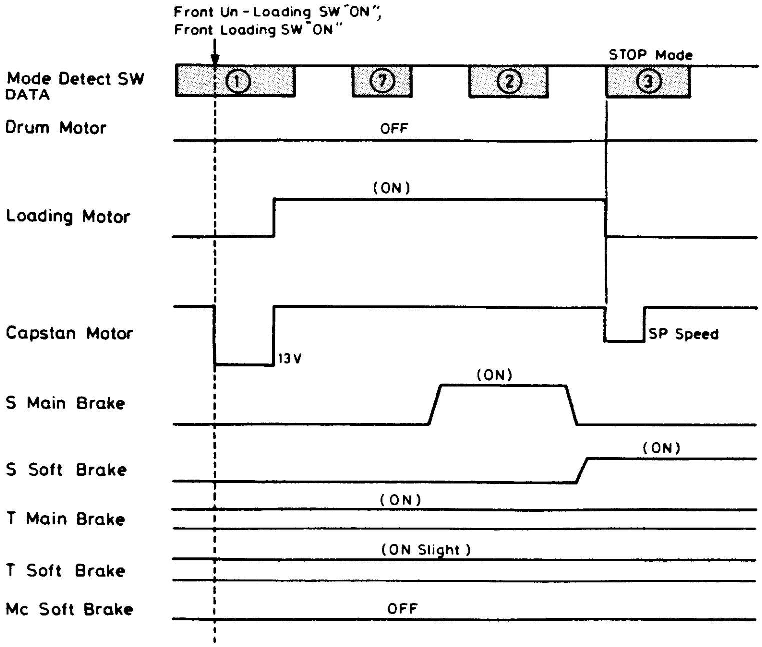

Front Un - Loading SW "ON",
Front Loading SW "ON"
STOP Mode
Mode Detect SW DATA
①
⑦
②
③
Drum Motor
OFF
(ON)
Loading Motor
Capstan Motor
13V
SP Speed
S Main Brake
(ON)
S Soft Brake
(ON)
T Main Brake
(ON)
T Soft Brake
(ON Slight)
Mc Soft Brake
OFF

Table 1-3-2 Timing chart of CASSETTE IN mode

### (2) From STOP mode to PLAY mode

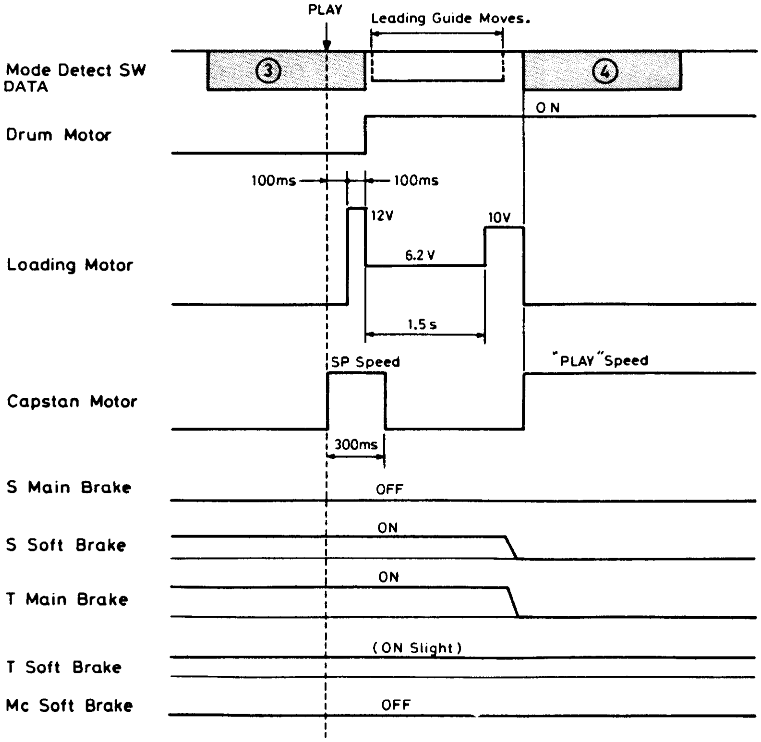

PLAY
Leading Guide Moves.
Mode Detect SW DATA
③
④
ON
Drum Motor
100ms
100ms
12V
10V
6.2V
Loading Motor
1.5s
SP Speed
"PLAY" Speed
Capstan Motor
300ms
S Main Brake
OFF
S Soft Brake
ON
T Main Brake
ON
T Soft Brake
(ON Slight)
Mc Soft Brake
OFF

Table 1-3-3 Timing chart of STOP mode to PLAY mode

### (3) PLAY mode to R-SEARCH mode

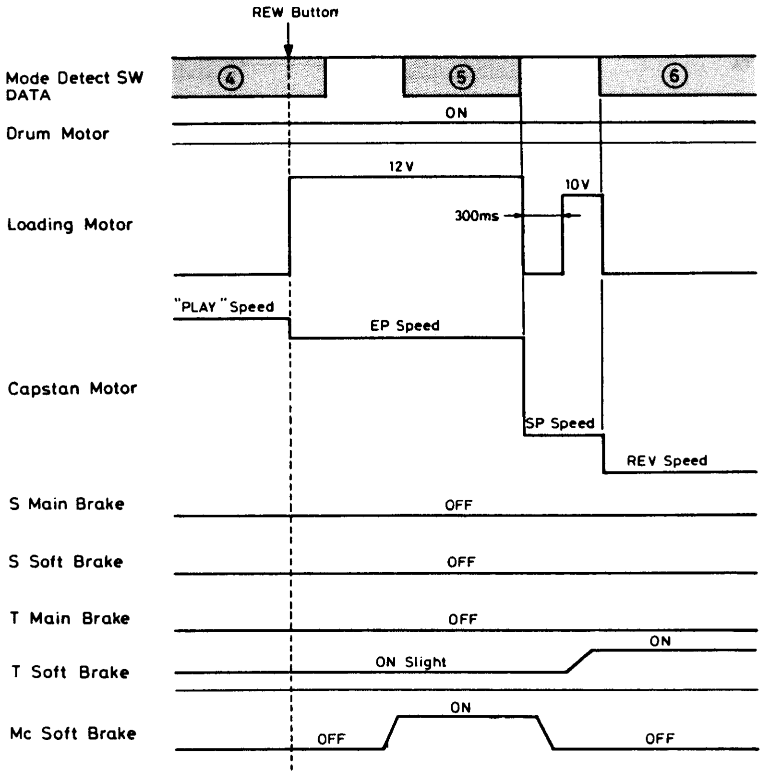

REW Button
Mode Detect SW DATA
④
⑤
⑥
Drum Motor
ON
Loading Motor
12V
10V
300ms
Capstan Motor
"PLAY" Speed
EP Speed
SP Speed
REV Speed
S Main Brake
OFF
S Soft Brake
OFF
T Main Brake
OFF
T Soft Brake
ON Slight
ON
Mc Soft Brake
OFF
ON
OFF

Table 1-3-4 Timing chart of PLAY mode to R-SEARCH mode

### (4) REC mode to PAUSE mode

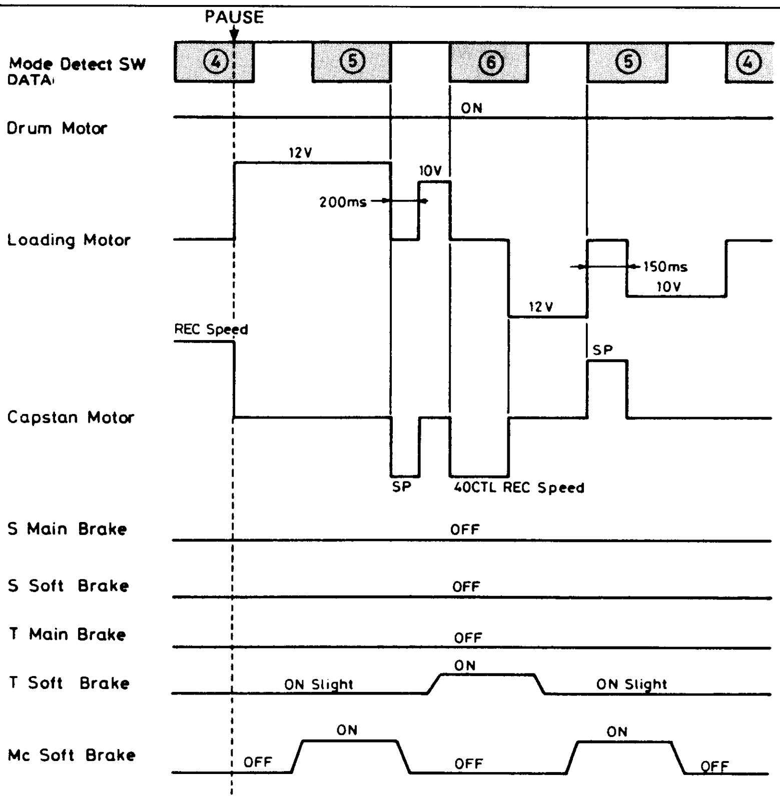

PAUSE
Mode Detect SW DATA
④
⑤
⑥
⑤
④
Drum Motor
ON
Loading Motor
12V
10V
200ms
12V
150ms
10V
Capstan Motor
REC Speed
SP
SP
40CTL REC Speed
S Main Brake
OFF
S Soft Brake
OFF
T Main Brake
OFF
T Soft Brake
ON Slight
ON
ON Slight
Mc Soft Brake
OFF
ON
OFF
ON
OFF

Table 1-3-5 Timing chart of REC mode to PAUSE mode.

## (5) PLAY mode to STOP mode

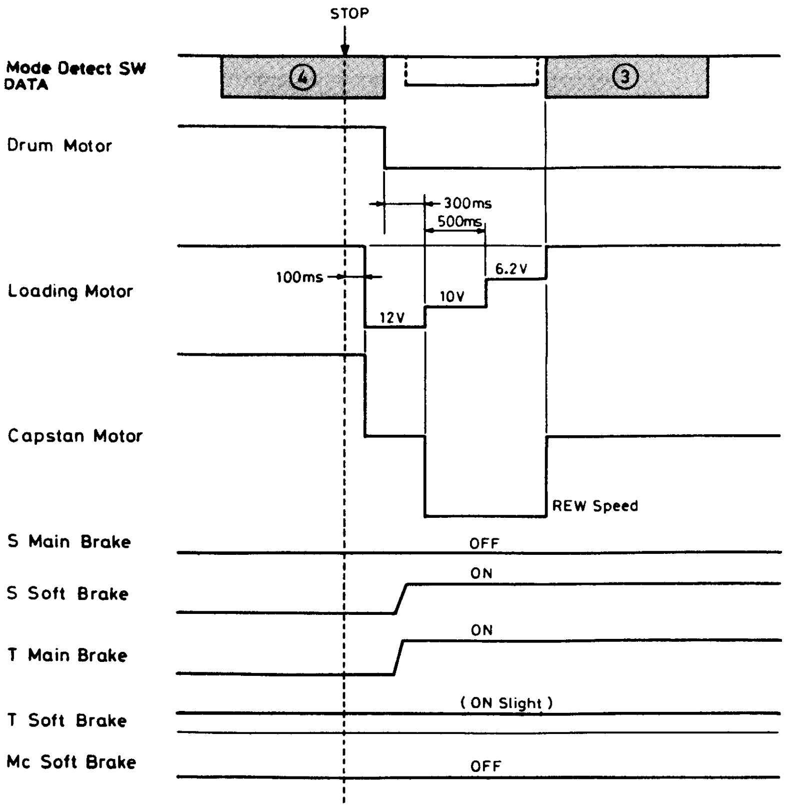

STOP
Mode Detect SW DATA
④
③
Drum Motor
300ms
500ms
Loading Motor
100ms
12V
10V
6.2V
Capstan Motor
REW Speed
S Main Brake
OFF
S Soft Brake
ON
T Main Brake
ON
T Soft Brake
(ON Slight)
Mc Soft Brake
OFF

Table 1-3-6 Timing chart of PLAY mode to STOP mode

## (6) STOP mode to F-FWD mode

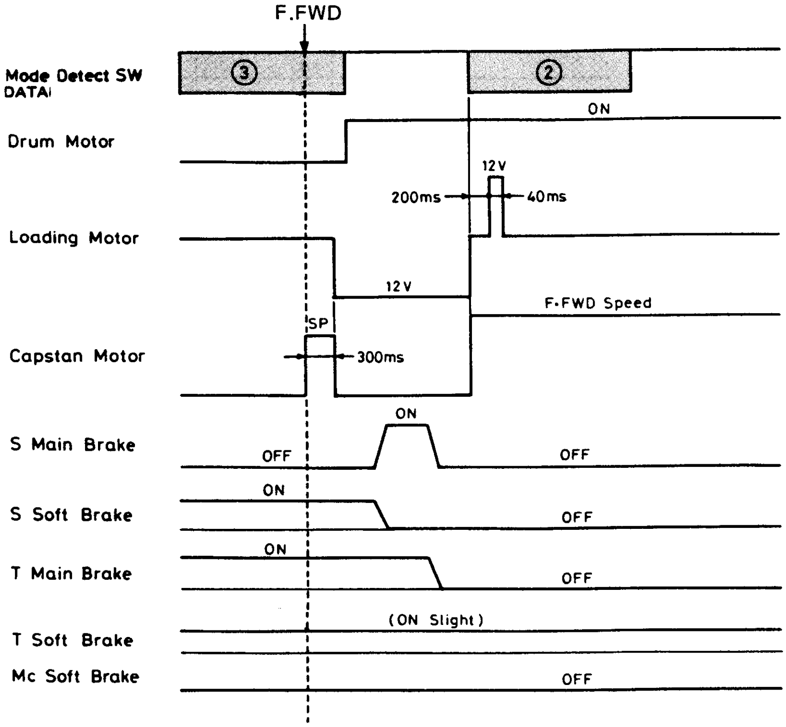

F.FWD
Mode Detect SW DATA
③
②
Drum Motor
ON
12V
200ms
40ms
Loading Motor
12V
F-FWD Speed
SP
Capstan Motor
300ms
ON
S Main Brake
OFF
OFF
ON
S Soft Brake
OFF
ON
T Main Brake
OFF
(ON Slight)
T Soft Brake
Mc Soft Brake
OFF

Table 1-3-7 Timing chart of STOP mode to F-FWD mode

### (7) STOP mode to REW mode

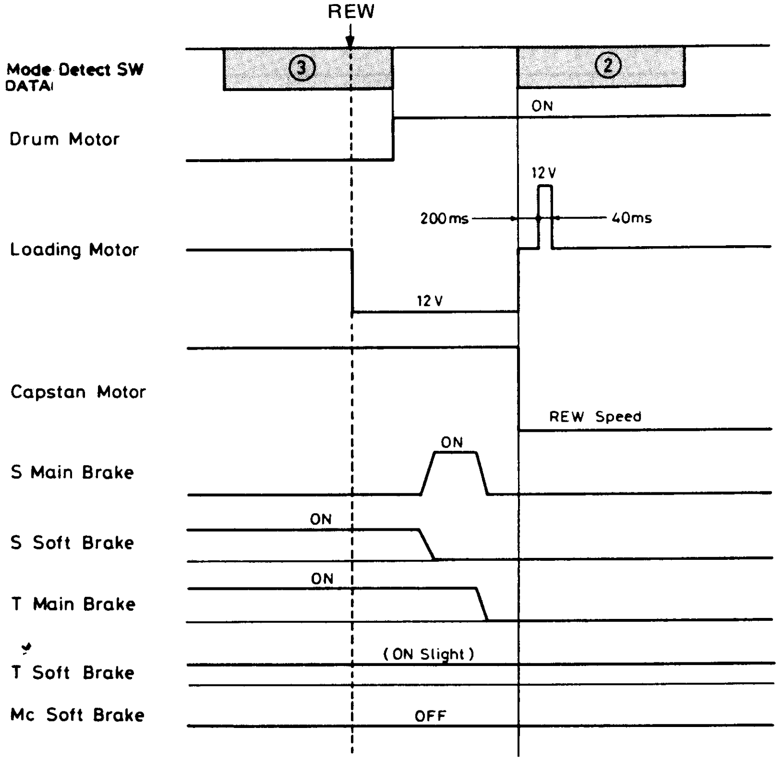

REW
Mode Detect SW DATA
③
②
Drum Motor
ON
Loading Motor
12V
200ms
40ms
12V
Capstan Motor
REW Speed
S Main Brake
ON
S Soft Brake
ON
T Main Brake
ON
T Soft Brake
(ON Slight)
Mc Soft Brake
OFF

Table 1-3-8 Timing chart of STOP mode to REW mode

### (8) STOP mode to EJECT mode

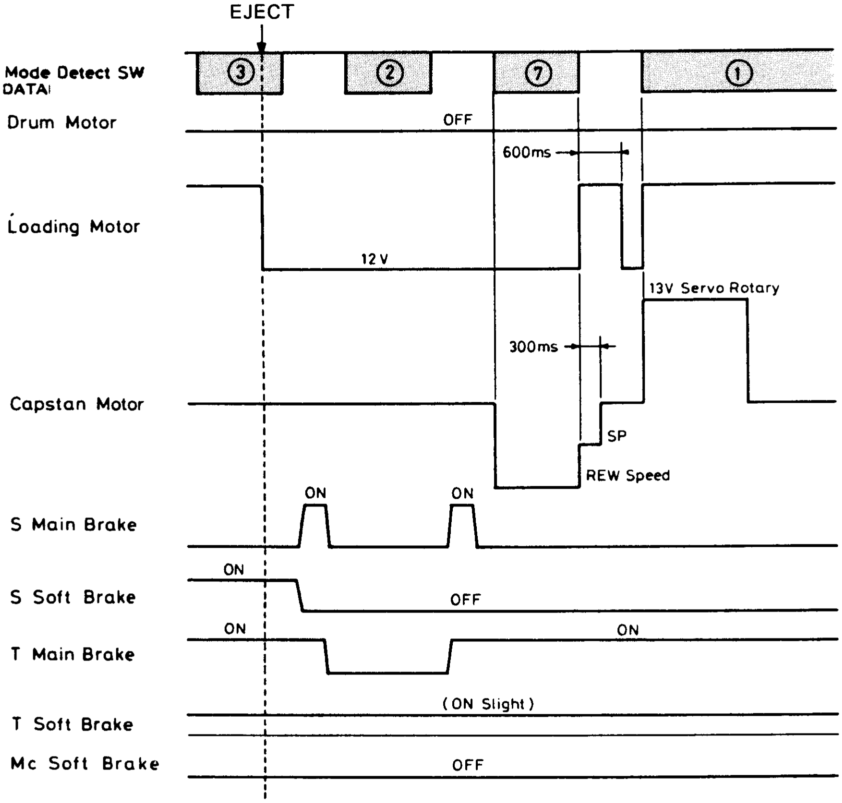

EJECT
Mode Detect SW DATA
③
②
⑦
①
Drum Motor
OFF
600ms
Loading Motor
12V
13V Servo Rotary
300ms
Capstan Motor
SP
REW Speed
S Main Brake
ON
ON
S Soft Brake
ON
OFF
T Main Brake
ON
ON
T Soft Brake
(ON Slight)
Mc Soft Brake
OFF

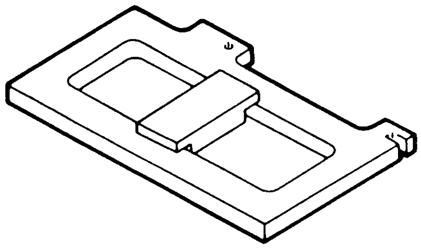
Table 1-3-9 Timing chart of STOP mode to EJECT mode

# 2. MECHANISM ADJUSTMENTS

## 2-1. JIGS AND TOOLS FOR ADJUSTMENT

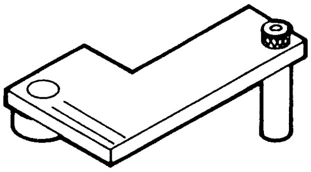
| No. | Part Name | Part No. | Remarks |
|---|---|---|---|
| 1 | Cassette stand plate gauge | VHJ-0001 | Adjustment of reel height |
| 2 | Position adjustment gauge | VHJ-0030 | Adjustment of back tension guide |
| 3 | Eccentric screwdriver | VHJ-0003 | Tape path alignment |
| 4 | Torque gauge driver | VHJ-0014 | Adjustment of fixed screws |
| 5 | Torque gauge | VHJ-0004 | Measurement for all winding torque |
| 6 | Alignment tape | VHJ-0008 | Colour-bar. 1kHz |
| 7 | Alignment tape | VHJ-0009 | Monoscope. 7kHz |
| 8 | Cassette torque meter | VHJ-0016 | Adjustment of back tension torque |

VHJ-0001



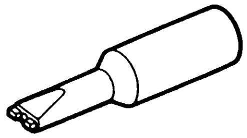
No. 1

VHJ-0030



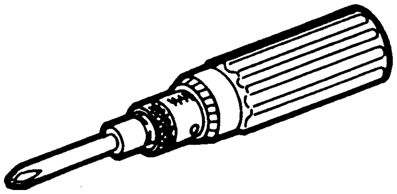
No. 2

VHJ-0003



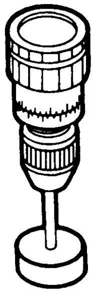
No. 3

VHJ-0014



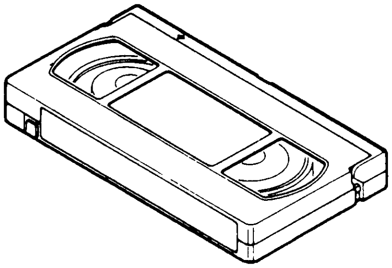
No. 4

VHJ-0004



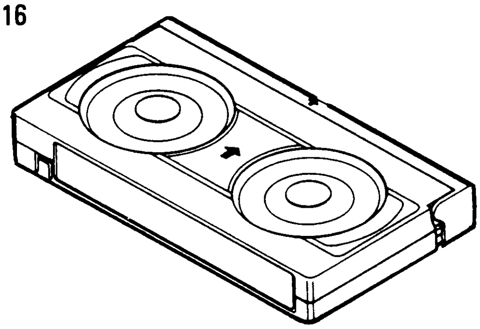
No. 5

VHJ-0008, VHJ-0009



No. 6, 7

VHJ-0016



No. 8

## 2-2. STANDARD MAINTENANCE TIMETABLE

In order to keep the VCR in peak working order, care for the parts indicated in **Table 2-2-1** at the periods given.

| Hours<br>Parts | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 |
|---|---|---|---|---|---|---|---|---|---|
| VIDEO HEAD | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ADUIO/CONTROL HEAD | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| FULL ERASE HEAD | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| CAPSTAN MOTOR | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| PINCH ROLLER | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| TAKE-UP REEL |  |  |  | ▲ |  |  | ▲ |  |  |
| SUPPLY REEL |  |  |  | ▲ |  |  | ▲ |  |  |

○ : Cleaning
▲ : Lubrication

Table 2-2-1

## 2-3. CLEANING

### 2-3-1. VIDEO HEAD (See Fig. 2-3-1.)

(1) Turn off the power. [Set the power switch to the OFF position.]
(2) Move the video head drum to a position at which the video heads are easy to clean.
(3) Wipe each head several times with the deerskin part of the head cleaning stick. If the heads are extremely dirty, wipe more times.

(Note)

- When pressing a finger on the head cleaning stick to clean the heads, do not press too hard.
- Do not move the head cleaning stick up and down against the video heads; doing so will damage the heads.

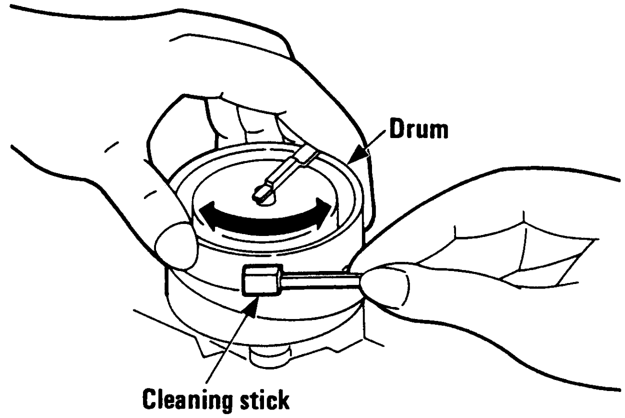


Fig. 2-3-1

### 2-3-2. TAPE PATH

Clean the surfaces of the tape guides and the drum tape path by using a soft cloth or cleaning stick moistened with an alcohol.

(Note)
When cleaning the drum surfaces, be careful not to contact the video heads.

### 2-3-3. PINCH ROLLER, CAPSTAN, SUPPLY AND TAKE-UP REEL BASE

(1) Using a soft cloth moistened with alcohol, clean the surfaces of the pinch roller, capstan, supply and take-up reel base.
(2) If there are scratches on the pinch roller, remove the E-ring and replace the pinch roller lever assembly.

### 2-3-4. CLEANING THE AUDIO/CONTROL HEAD AND FULL-ERASE HEAD (See Fig. 2-3-2, 2-3-3.)

Apply alcohol to the cleaning stick, and move the cleaning stick against the heads in the direction of the head gap.

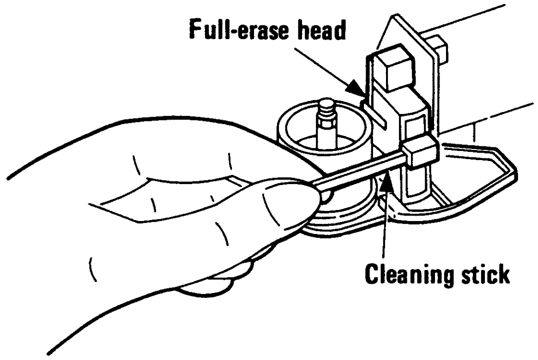


Fig. 2-3-2

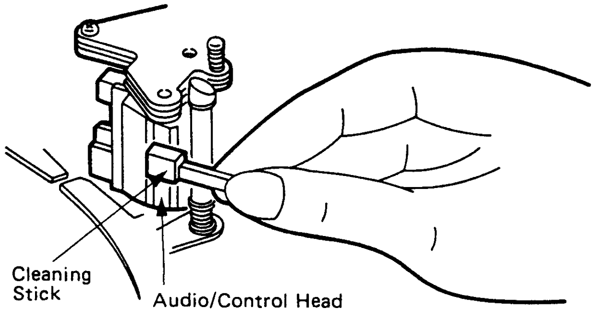


Fig. 2-3-3

## 2-4. MECHANISM REPAIR AND PARTS REPLACEMENT

### 2-4.1. BACK TENSION BRAKE BAND AND BACK TENSION LEVER (See Fig. 2-4-1.)

(1) Remove the spring (a).

(2) Remove the screw (b) and washers (c), and then remove the brake band and backtension lever.

(3) Disconnect the brake band lever from the back tension lever.

(4) Install the new brake band by reversing the removal procedure.

**(Note)**

Be careful not to crease or scratch the new brake band.

(5) Adjust the position of the back tension lever.

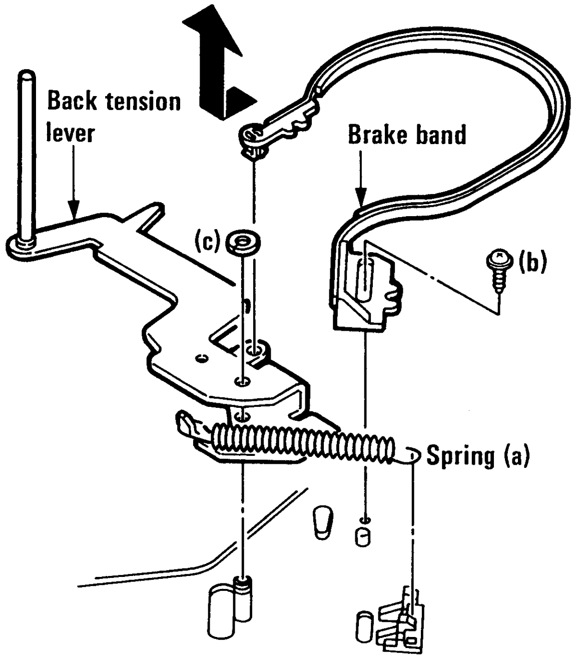

Back tension lever
Brake band
(c)
(b)
Spring (a)

Fig. 2-4-1

### 2-4-2. LOADING MOTOR (See Fig. 2-4-2.)

(1) Disconnect the loading motor connector.

(2) Remove the loading motor belt.

(3) Remove the screws (a), and then remove the loading motor assembly.

(4) Replace the loading motor, and install it in the reverse order of removal.

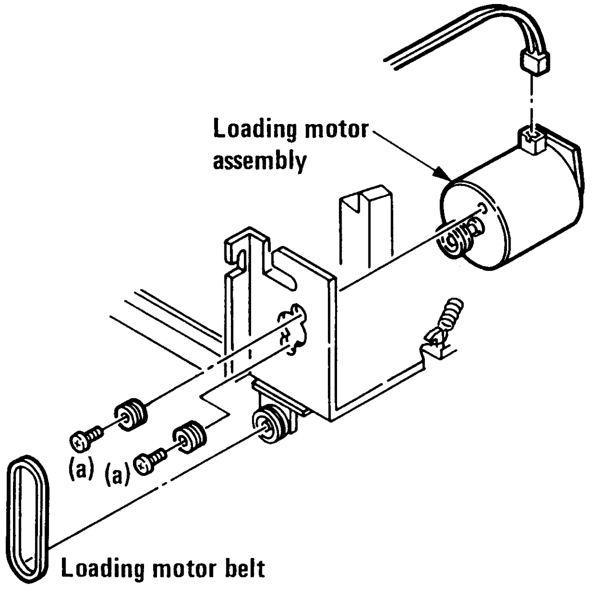

Loading motor assembly
(a)
(a)
Loading motor belt

Fig. 2-4-2

### 2-4-3. SUPPLY REEL BASE (See Fig. 2-4-3.)

(1) Remove the screw (a) of brake band.

(2) Remove the special washer (b) and washer (c), and then remove the supply soft brake reel base.

**(Note)**

Be careful not to lose the height adjustment spacer.

(3) Wipe off the old oil from the reel shaft by using a cloth moistened with alcohol, and then apply a small amount of new oil.

(4) If a new supply reel base is being installed, adjust the reel base height.

### 2-4-4. TAKE-UP REEL BASE (See Fig. 2-4-3.)

(1) Remove the special washer (d) and washer (e), and then remove the take-up reel base.

**(Note)**

Be careful not to lose the height adjustment spacer.

(2) Wipe off the old oil from the reel shaft by using a cloth moistened with alcohol, and then apply a small amount of new oil.

(3) If a new take-up reel base is being installed, adjust the reel base height.

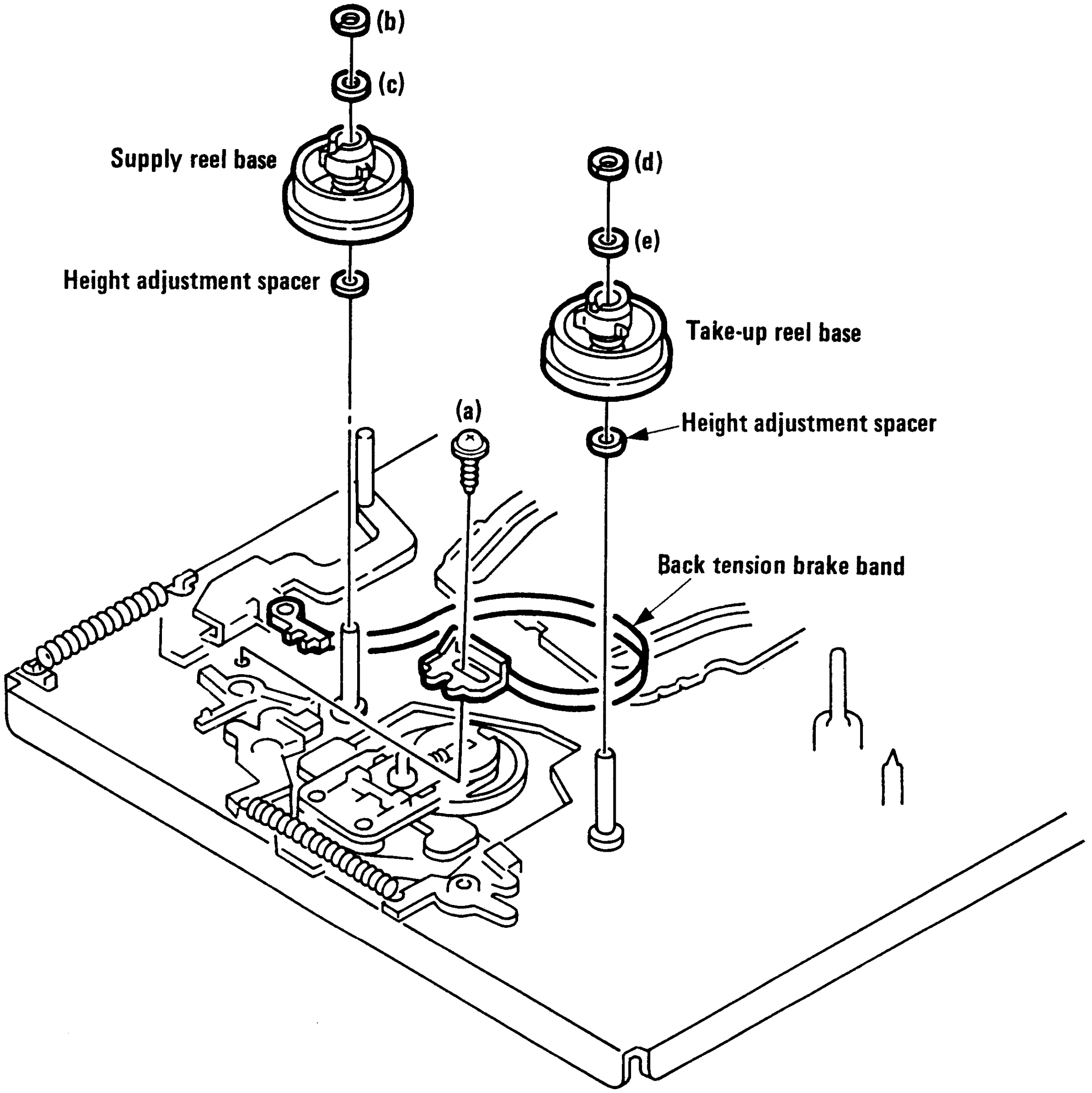

(b)
(c)
Supply reel base
Height adjustment spacer
(d)
(e)
Take-up reel base
(a)
Height adjustment spacer
Back tension brake band

Fig. 2-4-3

### 2-4-5. ROLLER ASSEMBLY (See Fig. 2-4-4.)

(1) Remove the special washer (a), and then remove the roller assembly.

(2) Install the new roller assembly by using the reverse order of the removal procedure.

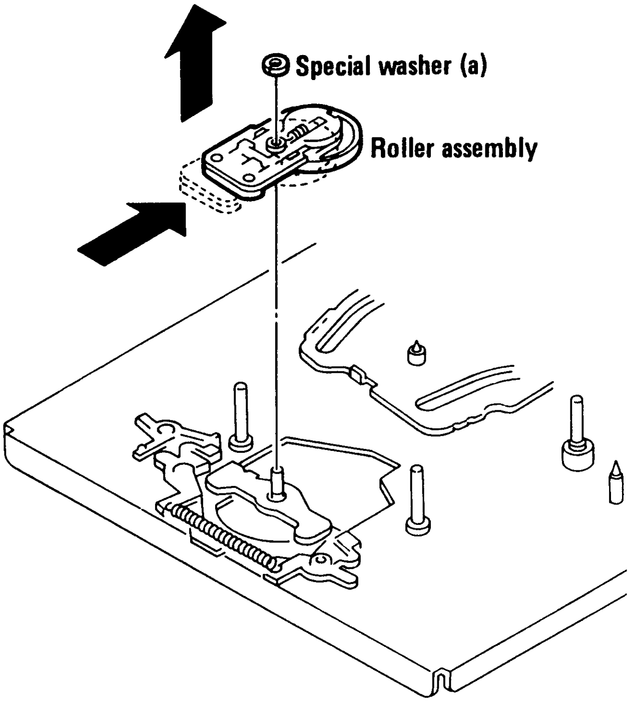

Special washer (a)
Roller assembly

Fig. 2-4-4

### 2-4-6. CAPSTAN MOTOR (See Fig. 2-4-5.)

(1) Disconnect the capstan motor connector (a).

**(Note)**

- Be sure that the power is off [the power switch in the OFF position] when connecting or disconnecting the connector.
- Set the mode detection switch to STOP mode. (Refer to ITEM 2-6-4) GEAR, MODE DETECTION SWITCH POSITION part).

(2) Remove the special washer (b), and then remove the eject lever (c).

(3) Remove the capstan motor belt (d).

(4) Remove the screws (e) securing the capstan motor, and then remove the motor.

(5) Install the new capstan motor by using the reverse order of the removal procedure.

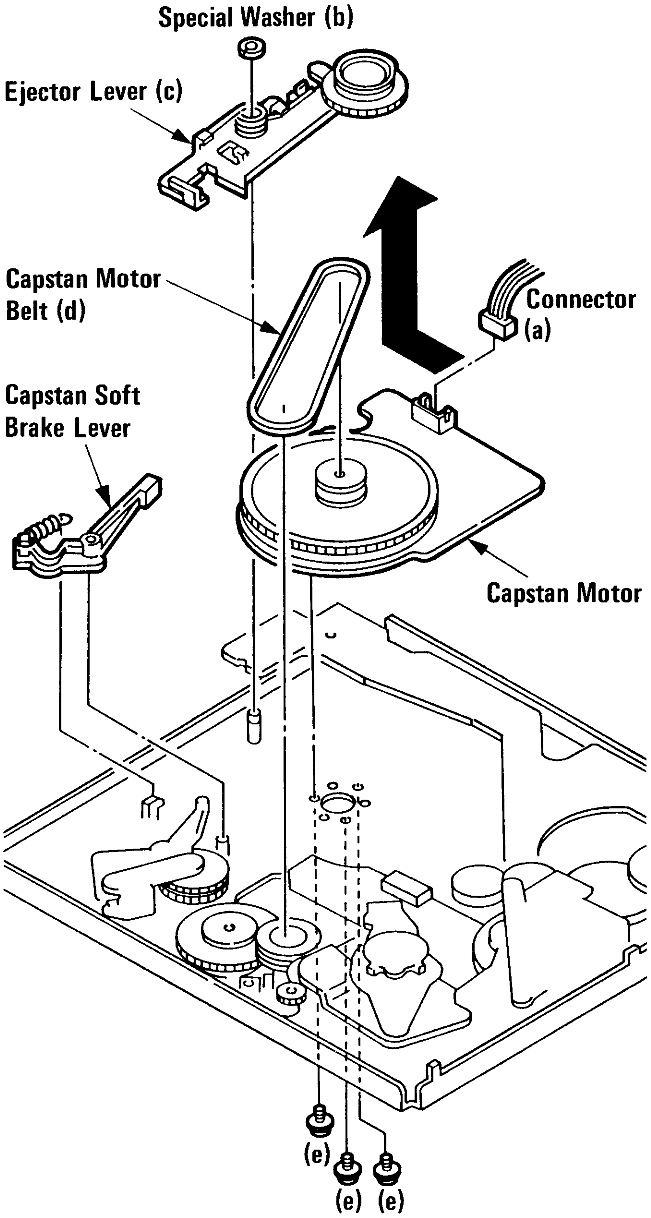
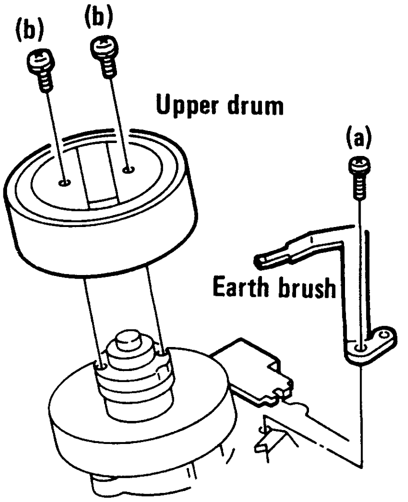

Special Washer (b)
Ejector Lever (c)
Capstan Motor Belt (d)
Connector (a)
Capstan Soft Brake Lever
Capstan Motor
(e)
(e)
(e)

Fig. 2-4-5

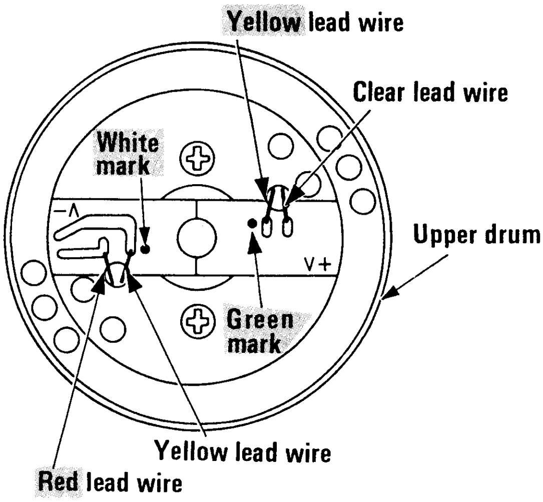
### 2-4-7. UPPER DRUM (See Fig. 2-4-6.)

(1) Remove the screw (a), and then remove the earth brush.

(2) Remove the screws (b) which hold the upper drum, and then remove the soldered lead wire.


(b)
(b)
Upper drum
(a)
Earth brush

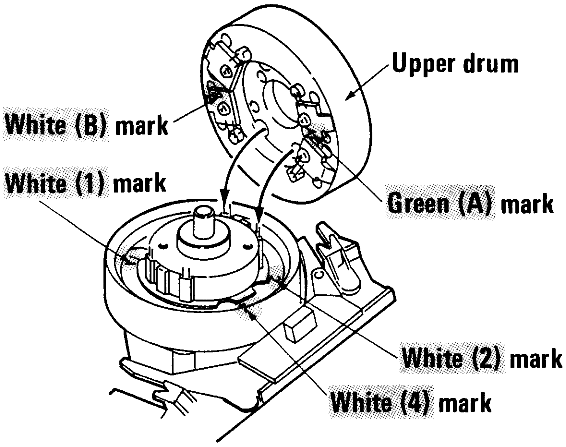
- **2-HEAD MODEL VIDEO HEAD LEAD WIRE POSITION (Top view) (MODEL: VHR-3300 (3200) SERIES)**


Yellow lead wire
Clear lead wire
White mark
Upper drum
V+
Green mark
Yellow lead wire
Red lead wire

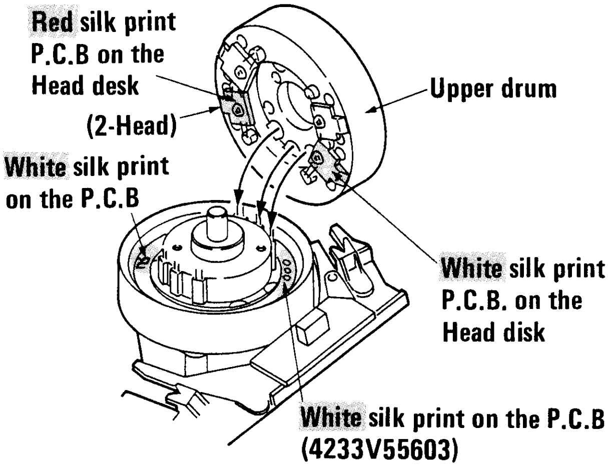
**(Note)**
Be careful to the solder the lead wire at the correct position.

(3) Check the tape path.

- **2-HEAD Hi-Fi MODEL UPPER DRUM POSITION (MODEL: VHR-3700 SERIES)**


Upper drum
White (B) mark
White (1) mark
Green (A) mark
White (2) mark
White (4) mark

- **3-HEAD Hi-Fi MODEL UPPER DRUM POSITION (MODEL: VHR-3800 SERIES)**


Red silk print P.C.B on the Head desk
(2-Head)
Upper drum
White silk print on the P.C.B
White silk print P.C.B. on the Head disk
White silk print on the P.C.B (4233V55603)

- **3-HEAD MODEL LEAD WIRE POSITION (MODEL: VHR-3500 SERIES)**

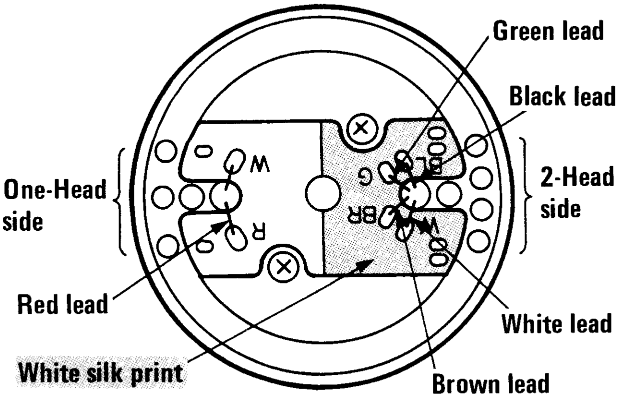

Green lead
Black lead
One-Head side
W
R
G
BL
BR
W
2-Head side
Red lead
White lead
White silk print
Brown lead

Fig. 2-4-6

### 2-4-8. ROTOR AND DRUM MOTOR (See Fig. 2-4-7.)

(1) Remove the screws (a) securing the rotor, and then remove the rotor.

(2) Remove the screws (b) securing the drum motor, and then remove the drum motor.

(3) Install the new drum motor by using the reverse order of the removel procedure.

**CAUTION: Make sure of positioning the Smallhole of rotor and the Hole of rotor-disc.**

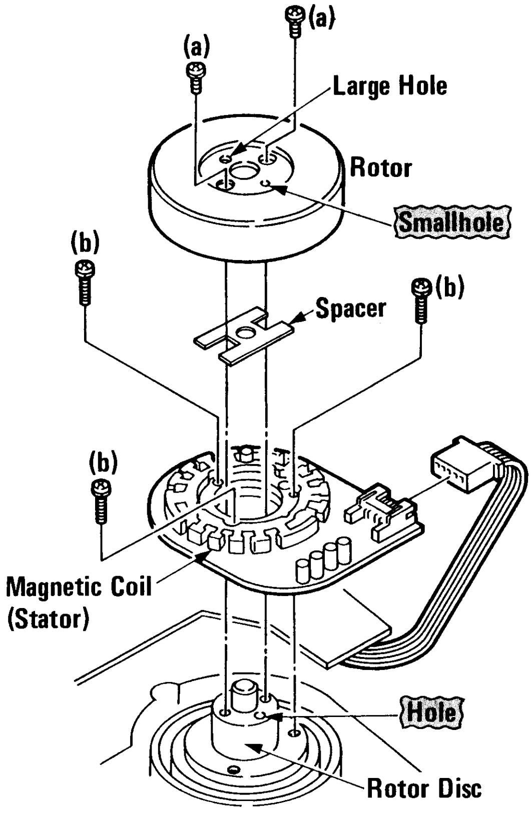

(a)
(a)
Large Hole
Rotor
Smallhole
(b)
Spacer
(b)
(b)
Magnetic Coil
(Stator)
Hole
Rotor Disc

Fig. 2-4-7

(Note)

- Use the torque gauge screwdriver (VHJ-0014) for installation of the drum motor and rotor.

The tightening torque of the drum motor and rotor are 3 kg-cm. (When installing, first tighten to a temporary tighteness and then tighten to the specified torque.)

### 2-4-9. DRUM ASSEMBLY (See Fig. 2-4-8.)

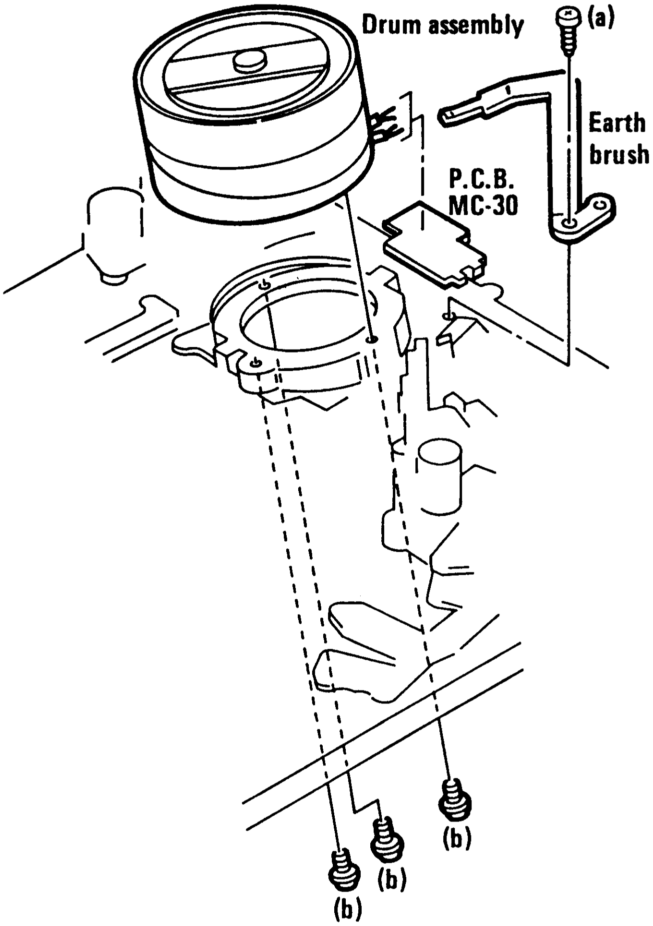
(1) Remove the screw (a), and then remove the earth brush.

(2) Remove the soldered lead wires of MC-30.

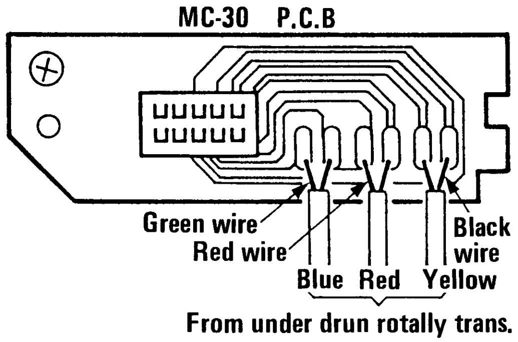
(3) Remove the screws (b), and then remove the drum assembly.

(Be careful not contact the video heads)

(4) Install the new drum assembly by using the reverse order of the removal procedures.


Drum assembly
(a)
Earth
brush
P.C.B.
MC-30
(b)
(b)
(b)

**3-Head** model under drum rotary trans.
lead wires install position


MC-30 P.C.B
Green wire
Red wire
Black
wire
Blue
Red
Yellow
From under drun rotally trans.

**2-Head** model under drum rotary trans.
Lead wires install position

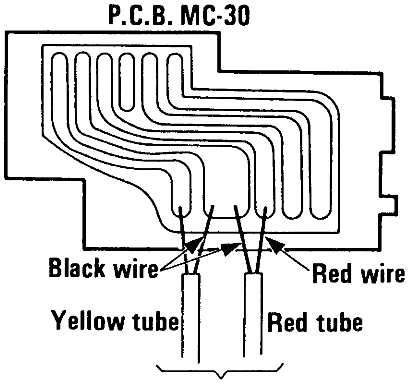

P.C.B. MC-30
Black wire
Red wire
Yellow tube
Red tube
From under drum rotaly trans.

Fig. 2-4-8

### 2-4-10. AUDIO/CONTROL HEAD ASSEMBLY (See Fig. 2-4-9.)

(1) Remove the nut (a) and sleeve (b) which hold the audio/control head assembly, and then disconnect the two connectors.
(2) Install the new audio/control head assembly.
(3) Adjust the tape path.

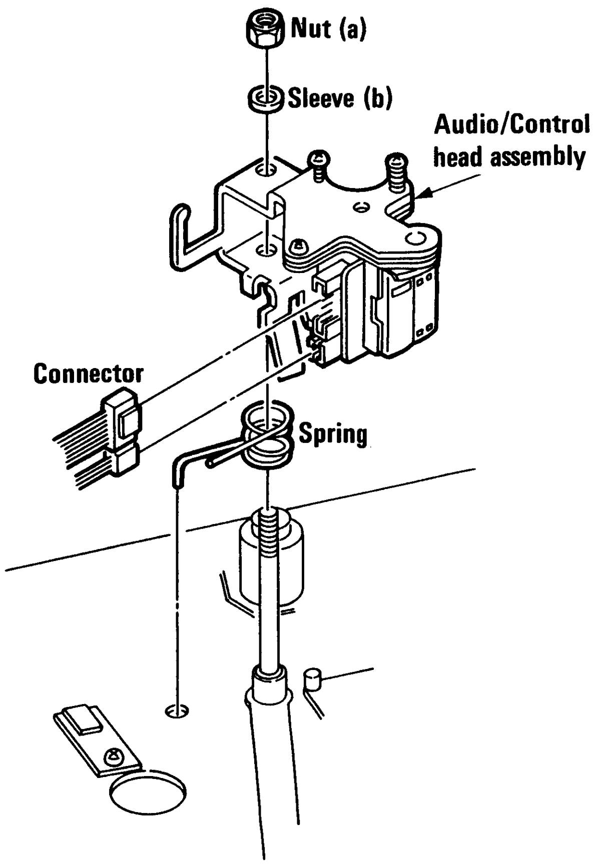

Nut (a)
Sleeve (b)
Audio/Control head assembly
Connector
Spring

Fig. 2-4-9

### 2-4-11. FULL-ERASE HEAD ASSEMBLY (See Fig. 2-4-10.)

(1) Remove the spring (a) and nut (b), and then remove the inpedance roller.
(2) Disconnect the 2 pin connector.
(3) Remove the full-erase head assembly.
(4) Install the new full-erase head assembly.

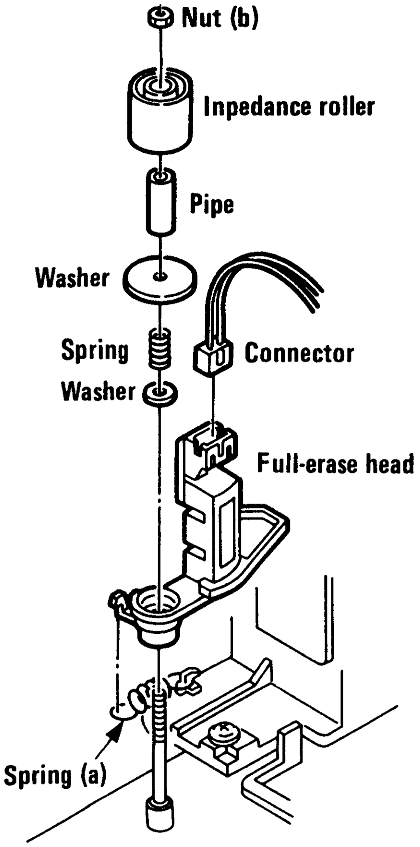

Nut (b)
Inpedance roller
Pipe
Washer
Spring
Connector
Washer
Full-erase head
Spring (a)

Fig. 2-4-10

## 2-5. PREPARATIONS FOR ADJUSTMENT (See Fig. 2-5-1.)

**How to operate the mechanism without a tape cassette**

1. Cover the FWD sensor and REW sensor using a piece of black vinyle tape or similar material so that light cannot be received.
2. Insert the tape cassette by hand, and then pull it out when the cassette tray begins to move.
3. In this condition, each mode can be operated.

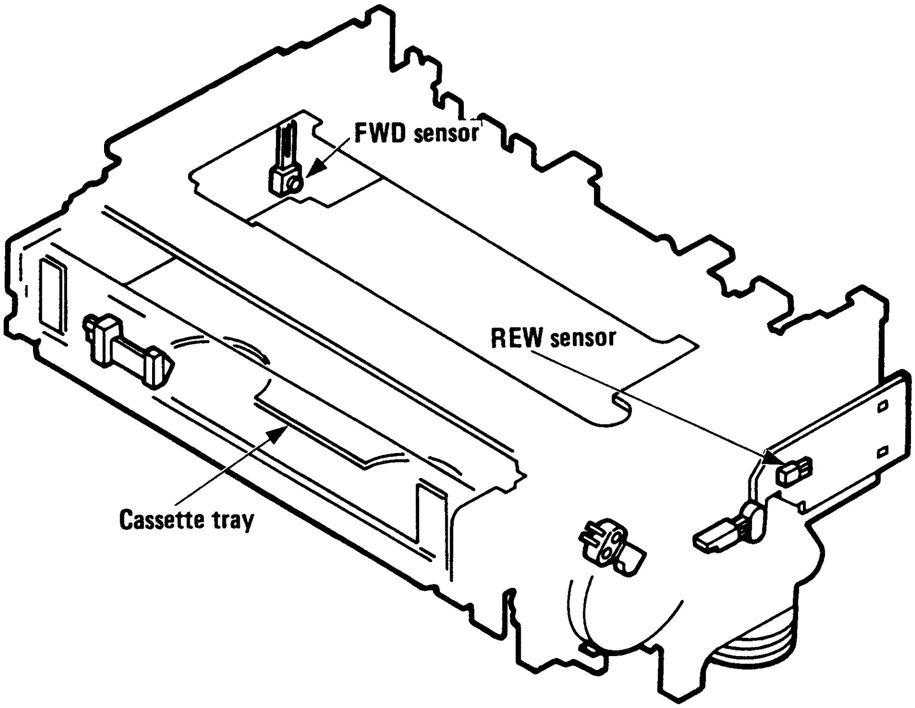


Fig. 2-5-1

## 2-6. ADJUSTMENTS

### 2-6-1. REEL BASE HEIGHT (See Fig. 2-6-1.)

If the supply reel base or the take-up reel base is replaced, it will be necessary to adjust the reel base height.

(1) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.

(2) Confirm that, when the gauge stops, the reel bases are not in contact with surface A of the plate and are in contact with surface B.

(3) If the reel base is in contact with surface A, remove a spacer and check again.

(4) If the reel base is not in contact with surface B, add a spacer and check again.

**(Note)**

- Adjust the reel base height by adding or changing spacers (0.13t, 0.2t, 0.25t and 0.5t) as appropriate so that the height meets the *specifications*. Use the same method for both the take-up reel base and the supply reel base. (The 0.5t washer is included as the standard washer.)
- If the height of the reel base is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

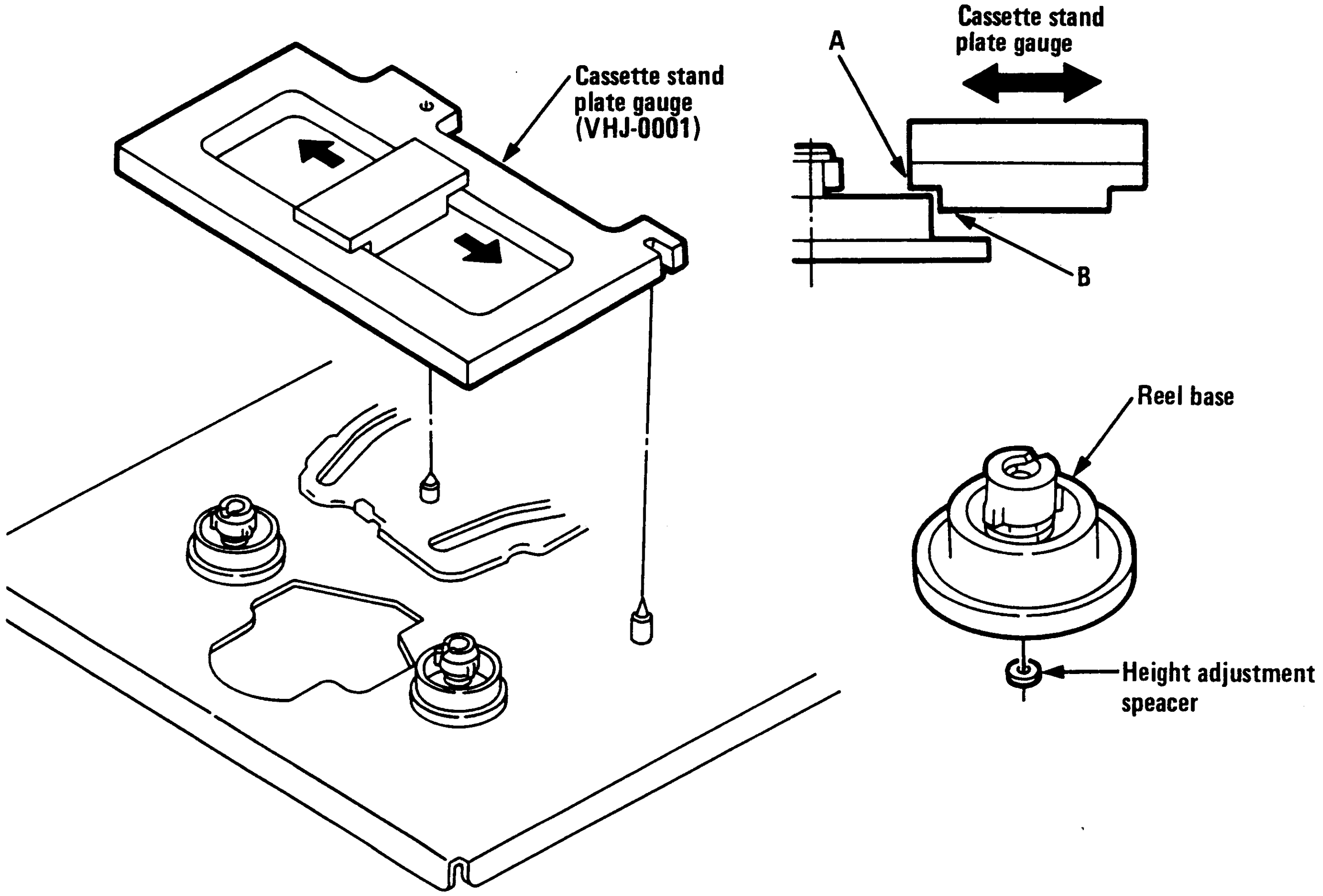

Cassette stand plate gauge (VHJ-0001)
A
Cassette stand plate gauge
B
Reel base
Height adjustment speacer

Fig. 2-6-1

### 2-6-2. BACK-TENSION LEVER POSITIONING (See Fig. 2-6-2.)

(1) Begin the playback mode without inserting a tape cassette. After loading finishes, disconnect the power cord from the power outlet.

(2) Attach the back-tension lever position-confirmation gauge (VHJ-0030).

(3) Check to be sure that the back-tension lever is within the marking line on the back-tension lever position-confirmation gauge.

(4) If is not, adjust the screw (a) so that it is with in the line.

(5) Remove the back-tension lever position-confirmation gauge.

**(Note)**

- Handle the back-tension lever position-confirmation gauge carefully when attaching and removing it, so as not to damage the video heads.
- If not at the *specified* position and not within the specified value, the tape path might become unstable.

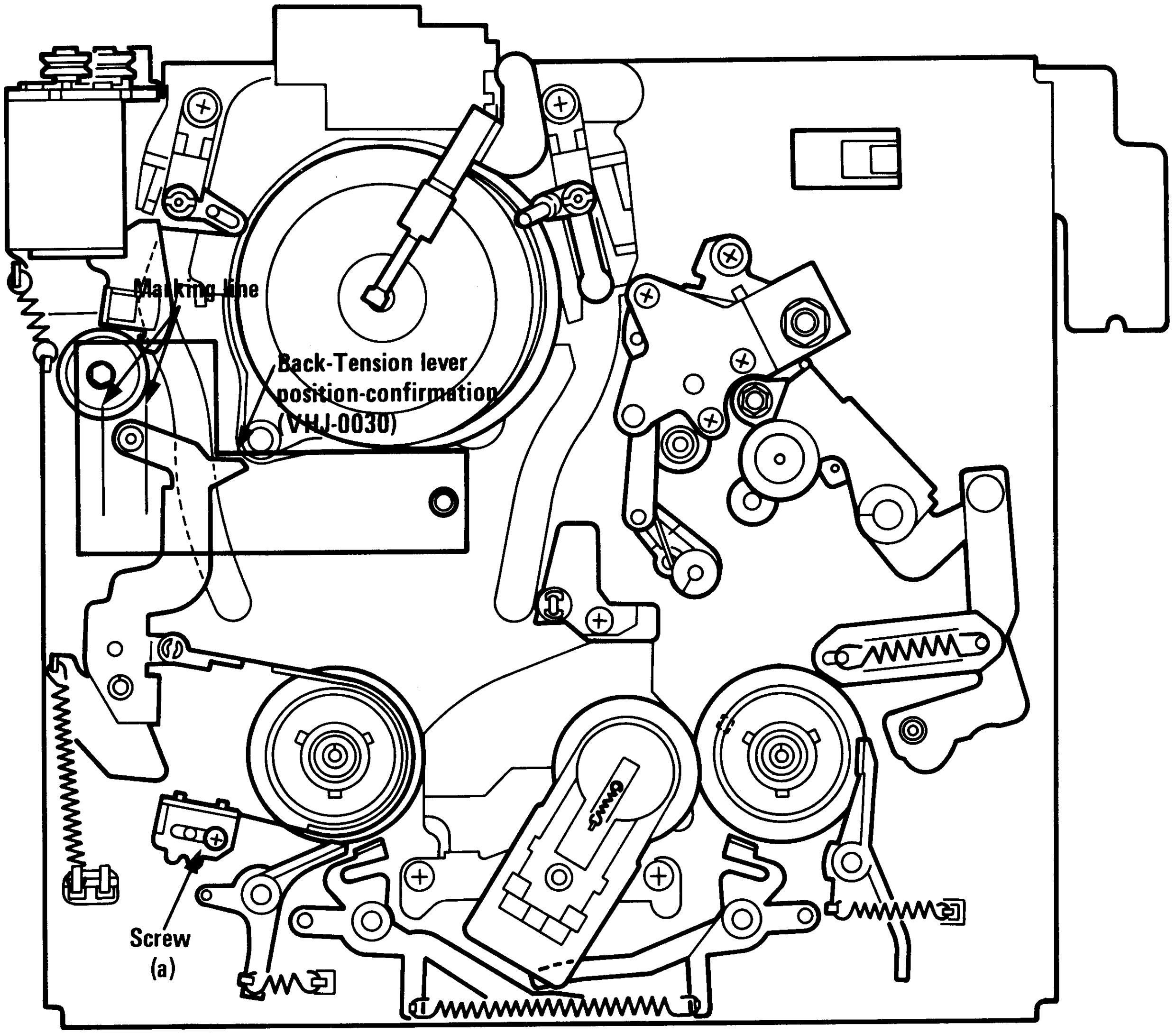

Marking line
Back-Tension lever position-confirmation (VHJ-0030)
Screw (a)

Fig. 2-6-2 (Top View)

### 2-6-3. BACK-TENSION TORQUE (See Fig. 2-6-3.)

(1) Load the cassette torque meter (VHJ-0016) and set to the PLAY mode.

(2) Check whether or not the back-tension torque value is within 37 ~ 67g-cm.

(3) If not, the bracket position should be adjusted.

(A) Press the EJECT button and eject the cassette torque meter.

(B) Change the position of the spring coil.

(4) Load the cassette torque meter once again and check the back-tension torque value.

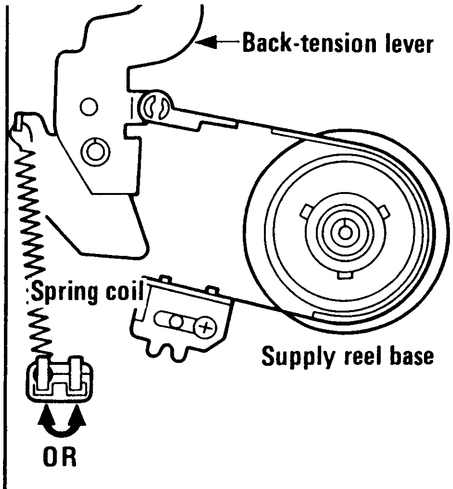

Back-tension lever
Spring coil
Supply reel base
OR

Fig. 2-6-3

## 2-6-4. GEAR & MODE DETECTION SWITCH POSITIONNING (See Fig. 2-6-4.)

If the gear, cam and mode-detection switch, etc. is removed or replaced, it will be necessary to make each of the position alignments.

Therefore, before removing these parts, be sure to first set the unit to the STOP mode, and then remove the parts. The gear and mode-detection switch position will be the EJECT mode (with the cassette out).

(1) Move from the EJECT mode to the STOP mode by sliding. To do this, rotate counterclockwise (as viewed from the bottom side of the worm gear assembly). The STOP mode is where the notch position of the mode-detection switch and the position of the hole mark of cam gear II are at ⓐ and ⓑ in the figure.

(Note)

- If camgear II is removed, be sure, before removing it, to first remove spring coil ⓒ for both of the main brakes (at the mechanism top side) while in the STOP mode.

(2) The installation order (A), (B) and (C) is to be followed for installation, being sure to follow points ⓑ andⓐ for each.

(Note)

- If the mode position of the mode-detection switch or the mark position between each gear is not correct, an operation malfunction will result.

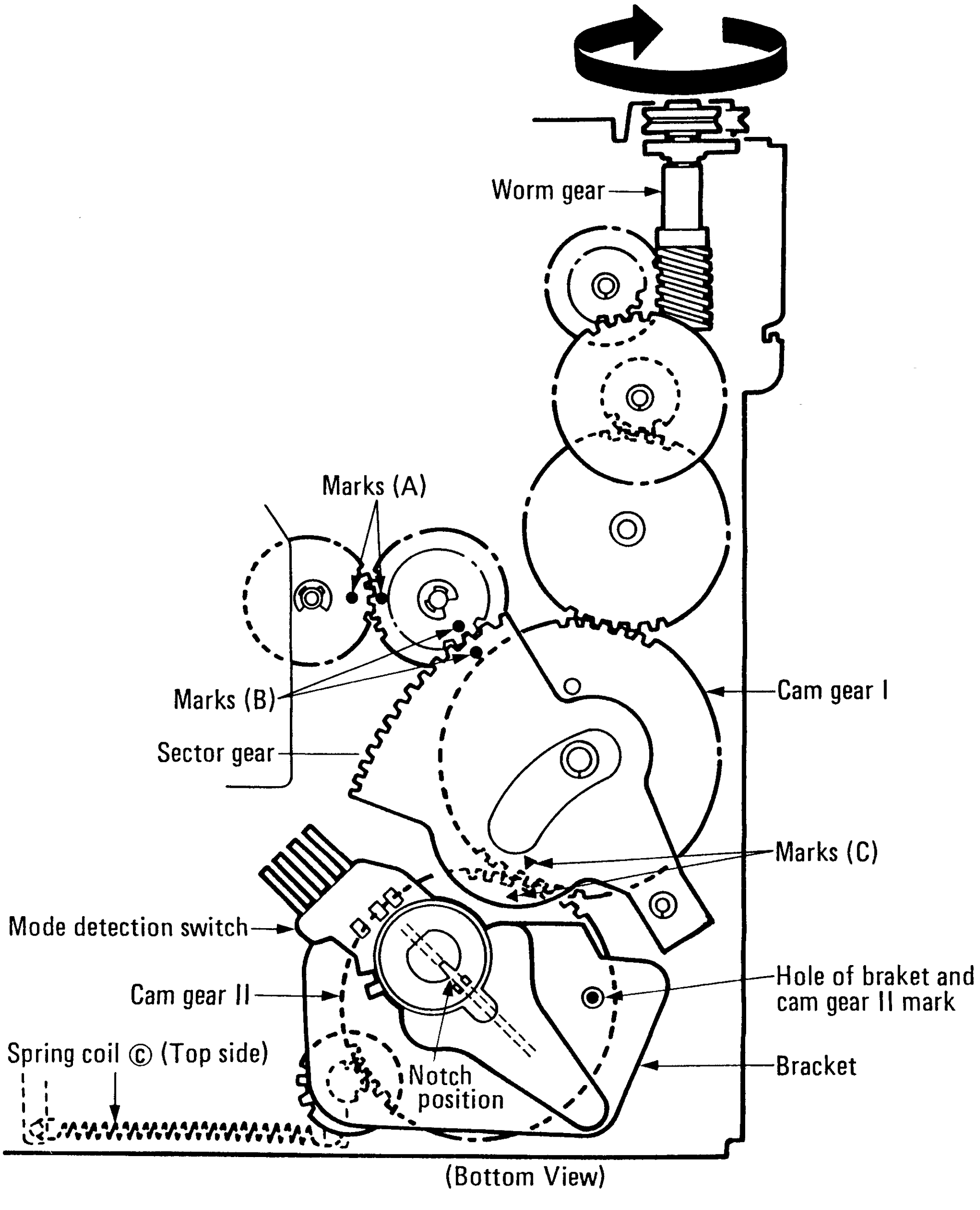

Worm gear
Marks (A)
Marks (B)
Sector gear
Cam gear I
Marks (C)
Mode detection switch
Cam gear II
Hole of braket and cam gear II mark
Spring coil ⓒ (Top side)
Bracket
Notch position
(Bottom View)

Fig. 2-6-4

### 2-6-5. CHECKING THE TORQUE (See Fig. 2-6-5.)

Using the torque meter (VHJ-0004), measure the torque in each mode.

| Mode | Torque |
|---|---|
| PLAY | 70 ~ 130g · cm |
| F-SEARCH | 80 ~ 160g · cm |
| R-SEARCH | 120 ~ 220g · cm |
| FWD/REW | 700g · cm or more |
| UNLOADING | 70 ~ 130g · cm |

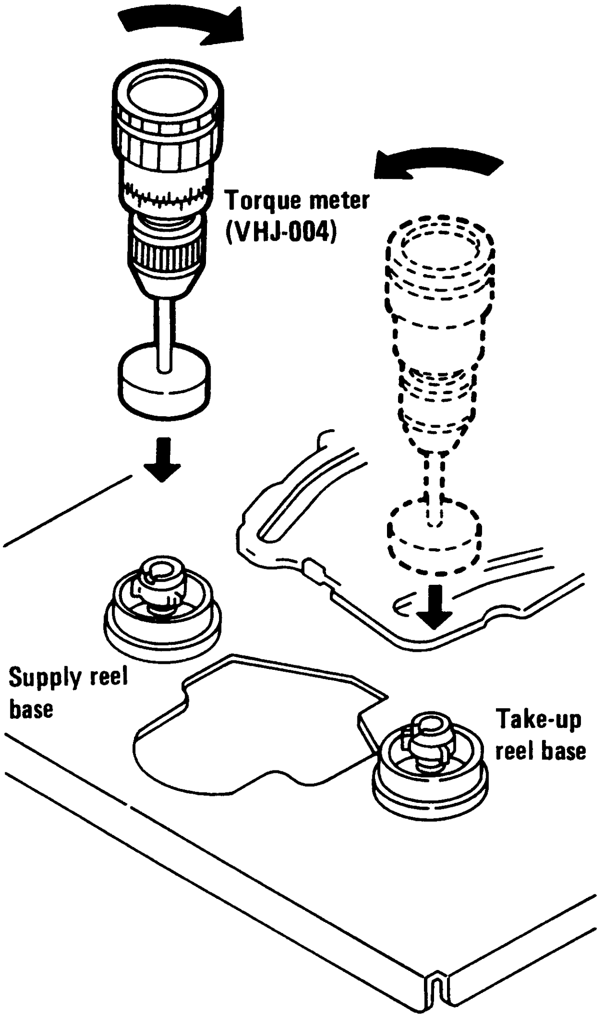


Fig. 2-6-5

(Note)

(1) The unloading take-up torque indicates the torque when unloading starts.

(2) For play, F-search and R-search, measure while turning the torque meter at a rate of about once in 3 seconds.
For FWD, REW and unloading, measure while the torque meter is in the locked-torque condition.

(3) When the reel base is locked, the system is disabled. To change to another mode, press the stop button to change to the reset mode.

- Make the following checks if the torque value for each mode si not within the specified value.

(4) Check the capstan motor and main slip gear's pully groove for contamination (oil, etc.).

(5) Check the capstan belt for deterioration.

(6) Check the felt within the main slip gear, play gear and review gear for deterioration, etc.
If a problem is found for (5) or (6), the part should be replaced.

## 2-7. CHECKING AND ADJUSTING THE TAPE-TRANSPORT SYSTEM (See Fig. 2-7-1, Fig. 2-7-2.)

The tape-transport system has already been precisely adjusted by the manufacturer, and therefore no adjustment should normally become necessary.

Such checking and adjustment may however become necessary when, after long use, a component part of the tape-transport system is replaced, etc.

(1) Cleaning the tape-transport system

Tape residue, dust and dirt may accumulate in the tape-transport system after long use. Check the tape-transport system after cleaning the tape contact surfaces.

(2) Test points when adjusting tape transport

Make the tape transport adjustments while monitoring the envelope (RF output waveform) and the audio output waveform.

- When monitoring the envelope (RF output waveform), connect the oscilloscope to CN1006 (on the VD-1 board) as

Pin (1): GND

Pin (2): envelope

Pin (3); RF switching pulse (for trigger)

- When monitoring the audio output waveform, connect the oscilloscope to the audio output terminal on the VD-1 board (rear panel terminal).

(3) Checking the tape-transport system

Check the following points by using the two end parts of a T120 tape.

- Check to be sure that, during playback, the tape is not out of position upward or downward (from the lead) at the drum entrance and drum exit. If there is any positional deviation, adjust the height of the entrance and/or exit guide.
- Check to be sure that, during playback, there are no creases or wrinkles of the tape at the entrance guide, exit guide, etc. If there appears to be an irregular condition, adjust the height of the entrance guide, exit guide, etc.

Using the wound part of a T120 tape, record and playback in the EP mode and check the following points.

- Check to be sure that, during playback and reverse search, there are no creases or wrinkles at each guide. If there appears to be an irregular condition, make a minor adjustment of the height at the entrance guide, exit guide, etc.
- Check the start of the picture on the TV screen, and the audio, when there is mode switching such as from rewind to play, reverse search to play, etc. If there appears to be an irregular condition, adjust the tape-transport system.

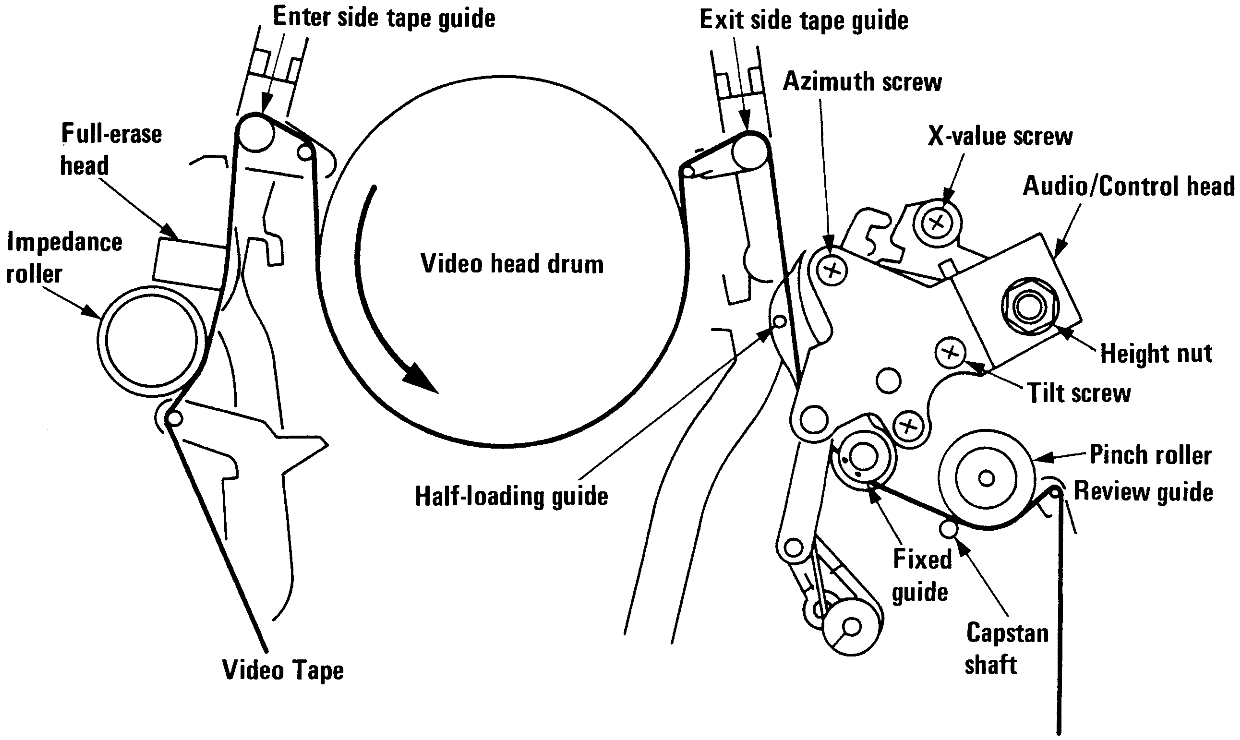
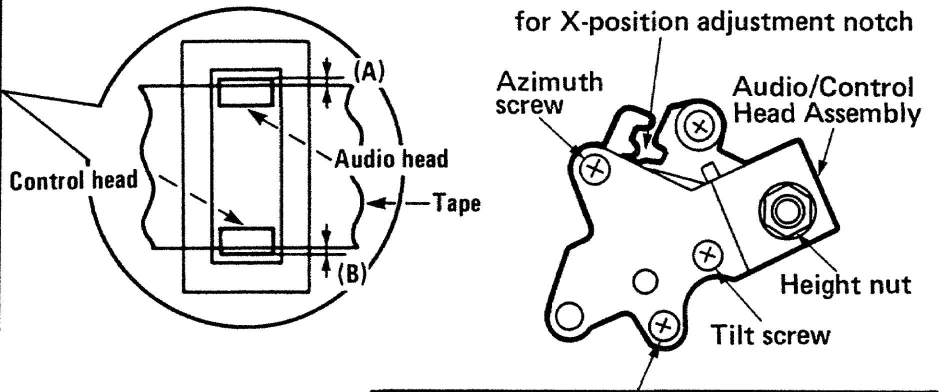

Enter side tape guide
Exit side tape guide
Azimuth screw
Full-erase head
X-value screw
Audio/Control head
Impedance roller
Video head drum
Height nut
Tilt screw
Pinch roller
Review guide
Half-loading guide
Fixed guide
Capstan shaft
Video Tape

Fig. 2-7-1

## TAPE-TRANSPORT ADJUSTMENT

| | Adjustment Item | Adjustment Point | Tape | Adjustment method | Notes and check points |
|---|---|---|---|---|---|
| 1 | ENTRANCE SIDE, EXIT SIDE TAPE GUIDE | ENTRANCE SIDE, EXIT SIDE TAPE GUIDE | VHJ-0009 | (1) Turn the tracking control to obtain the maximum envelope.<br>(2) Tighten the entrance and exit guides after alternately loosening them, and adjust to the point where the envelope is flat. | (1) Monitor the envelope at the RF switching pulse LOW side, (Monitor at the + side of the oscilloscope trigger slope.)<br>(2) Be careful not to tighten the entrance and exit guides excessively. (They should be tightened only to the extent that the front half and back half are not down.)<br>(3) The height of the impedance roller is not to be adjusted. (Only if there is fluctuation of the envelope front half, then an adjustment can be made (within a range of 90°) in the direction in which the tape is lifted. |
| 2 | FIXED TAPE GUIDE | FIXED TAPE GUIDE | VHJ-0009 | (1) In the playback mode, free the guide and align the flange below the guide with the tape. (Adjust so that the tape is not pushed upward.) | (1) If the tape is creased at the lower flange during R-search, lowr the fixed guide to the extent that there is no creasing. |
| 3 | AUDIO/CONTROL HEAD | AZIMUTH SCREW | VHJ-0009 | (1) Adjust (by the azimuth screw) the audio level to maximum. |  (A)<br>Audio head<br>Control head<br>Tape<br>(B)<br>for X-position adjustment notch<br>Azimuth screw<br>Audio/Control Head Assembly<br>Height nut<br>Tilt screw<br>**Note: This screw is set to the height adjustment standard for audio/control head, and therefore should not be touched.** |
| | | HEIGHT SCREW | | (2) Visually adjust the head height. [Adjust so that the upper part (A) of the audio head and the lower part (B) of the control head can be seen equally. | |
| | | TILT SCREW | | (3) If the audio level fluctuates, tighten the tilt screw within a range of 90°, and again make the adjustments in items (1) and (2). | |
| | | X-VALUE SCREW | | (4) Set the tracking VR to its center position and adjust so that the envelope is maximzed.<br>Method: Loosen the X-position adjustment screw by about 45°, then insert a flat-tip (–) screwdriver in the notch and adjust so as to obtain the maximum envelope. After completing the adjustment, firmly tighten the X-position adjustment screw. | |
| 4 | RECORDING/ PLAYBACK CHECK | ENTRANCE SIDE, EXIT SIDE TAPE GUIDE | (T120 TAPE RECORDING/ PLAYBACK) | ——— | (1) Check the envelope (front half down 50% or less) during playback.<br>(2) Check for tape creasing at each guide during playback and R-search. (Be careful of tape creasing at the fixed guide during R-search.) |

- **TAPE TRAVEL CHECK DIAGRAM**

(Note) ⤹ ⤸ marks: Tape regulation point

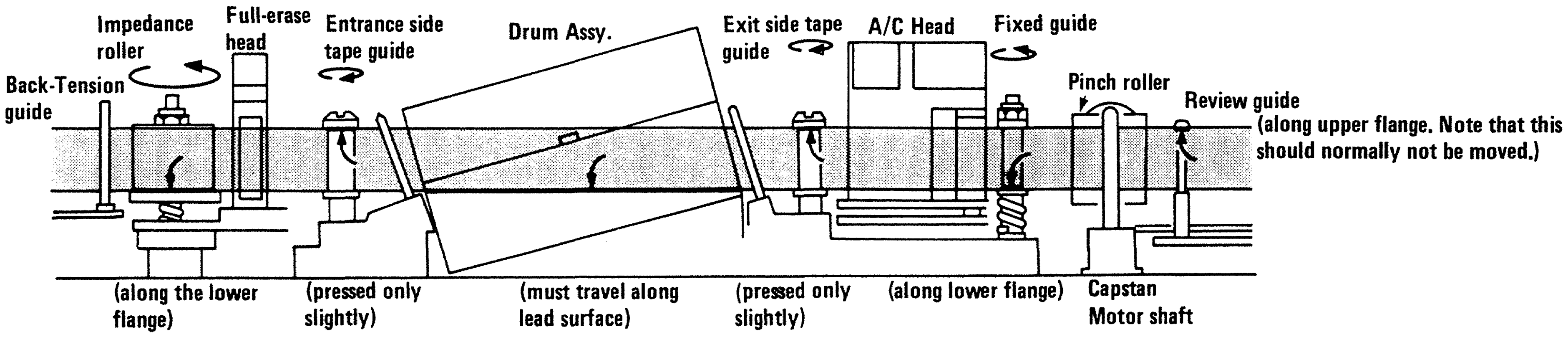

Impedance roller
Full-erase head
Entrance side tape guide
Drum Assy.
Exit side tape guide
A/C Head
Fixed guide
Back-Tension guide
Pinch roller
Review guide
(along upper flange. Note that this should normally not be moved.)
(along the lower flange)
(pressed only slightly)
(must travel along lead surface)
(pressed only slightly)
(along lower flange)
Capstan Motor shaft

Fig. 2-7-2

**SANYO Electric Co., Ltd.**
OSAKA, JAPAN

'87/June/6050 HA Printed in Japan

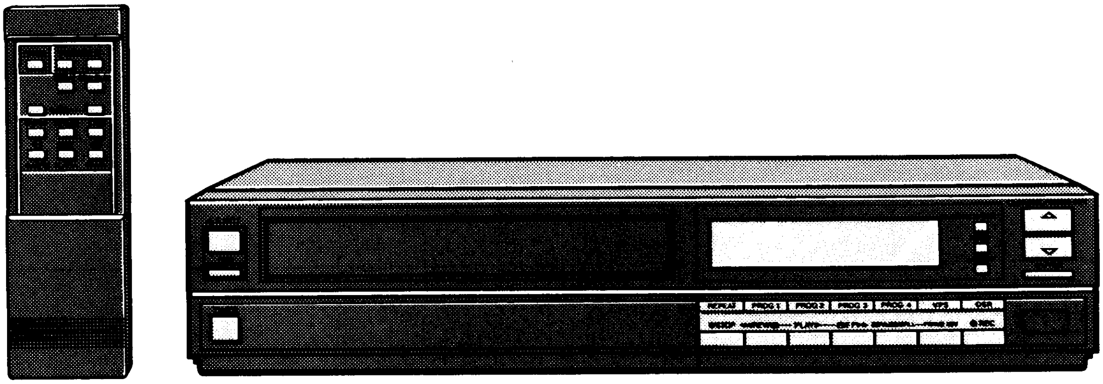
SERVICE MANUAL

SANYO

# VHR-3300

## COLOUR VIDEO CASSETTE RECORDER

VHS PAL HQ



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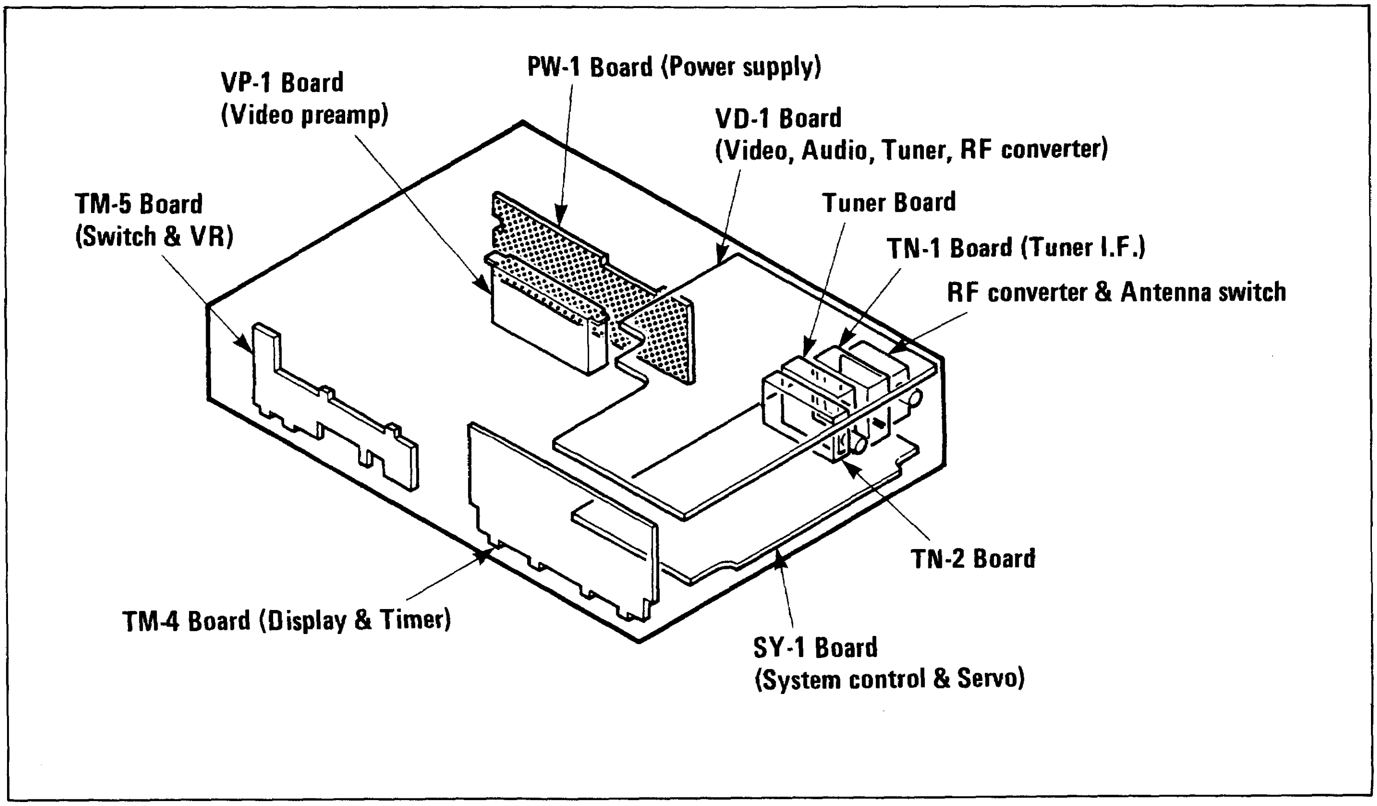
2. ELECTRICAL ADJUSTMENT .......................................... 1 ~ 7

BP2 SERIES

REFERENCE NO. WM-19930

## 1. LOCATION OF THE MAIN BOARDS


VP-1 Board
(Video preamp)
PW-1 Board (Power supply)
VD-1 Board
(Video, Audio, Tuner, RF converter)
TM-5 Board
(Switch & VR)
Tuner Board
TN-1 Board (Tuner I.F.)
RF converter & Antenna switch
TN-2 Board
TM-4 Board (Display & Timer)
SY-1 Board
(System control & Servo)

## 2. ELECTRICAL ADJUSTMENTS

### 2-1. PREPARATIONS

### 2-1-1. EQUIPMENTS

- Colour TV monitor
- Colour-bar generator (with RF and LINE OUTPUT)
- Audio frequency oscillator
- Attenuator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- Alignment cassette (VHJ-0008) Colour bar 1KHz
- Alignment cassette (VHJ-0009) Monoscope 6KHz
- Alignment cassette (VHJ-0010) RF Sweep
- Alignment cassette (VHJ-0023) PAL Monoscope 6KHz, PAL Colour-bar 1KHz, SECAM Colour-bar 1KHz, PAL RF Sweep MESECAM Colour-bar 1KHz, NTSC Colour-bar 1KHz.
- AC voltmeter
- In/output probes

### 2-1-2. SET-UP

Because the RF input signal is used for adjustment of circuits, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfy the items shown in figure. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3Vp-p.
- The amplitude of the video signal should be approximately 0.7Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

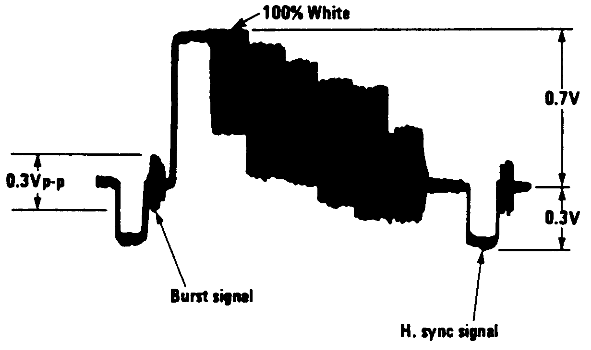
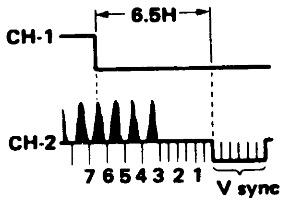
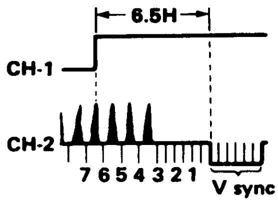
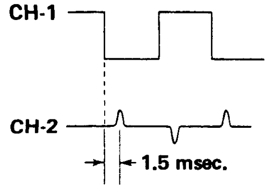


Fig. 2-2-1

## 2-2. SERVO CIRCUIT ADJUSTMENT ... SY-1 Board

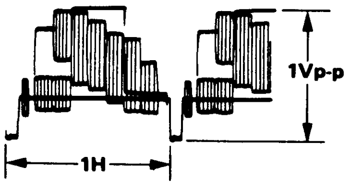
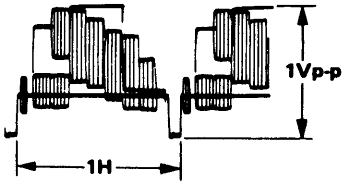
| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | CH-1 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4001 |  <br>Adjust SVR4001 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the fall of the CH-1 waveform. |
| 2 | CH-2 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4002 |  <br>Adjust SVR4002 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the rise of the CH-1 waveform. |

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 3 | TRACKING | Colour bar from Colour bar generator | REC<br>↓<br>PLAY | CN4008 ④<br>CN4008 ①<br>(trigger) | SVR4003 |  <br>1. Playback the recorded portion, and set the tracking control to the center click position.<br>2. Adjust SVR4003 so that the phase of the CH-2 waveform is 1.5 ±0.5msec after the fall of the CH-1 waveform. In this instance, delay the CH-2 waveform. |
| 4 | STILL V-LOCK | Colour bar from Colour bar generator | REC<br>↓<br>PLAY<br>↓<br>STILL | TV screen | SVR4004 | 1. Playback the recorded part, and put the VCR in the STILL mode.<br>2. Adjust SVR4004 so that the V jitter (very fine movement of the vertical sync) is minimized. |

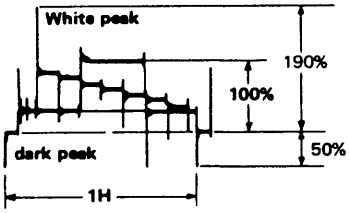
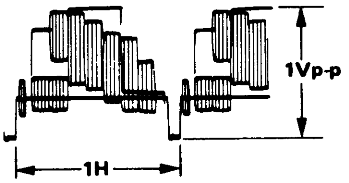
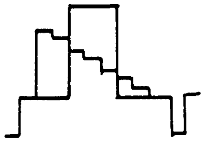
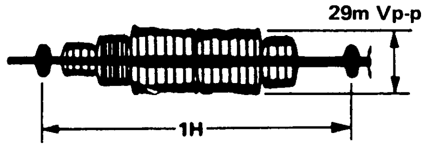
## 2-3. VIDEO CIRCUIT ADJUSTMENT ... VD-1 Board

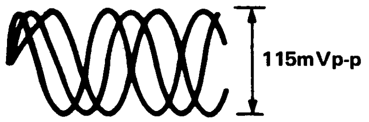
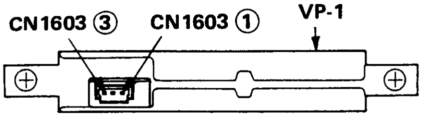
NOTE (1): When adjusting No. 1, No. 2 and No. 5 terminate VIDEO OUTPUT terminal (CN1021 pin 19 or RCA terminal) at 75 ohms.

(2): To make this adjustment, alternately make the adjustments described in No. 4 and No. 5 below. Repeat this procedure until both adjustment values are satisfied.

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | E-E LEVEL | Colour bar from Colour bar generator | E-E | TP1001 | SVR1007 |  <br>Adjust SVR1007 so that the level is 1.00 ±0.05 Vp-p. |
| 2 | PLAYBACK LEVEL | Alignment cassette (VHJ-0008 or VHJ-0023) | PLAY (Colour bar) | TP1001 | SVR1006 |  <br>Adjust SVR1006 so that the level is 1.00 ±0.05 Vp-p. |

NOTE (3): No-signal E-E mode is do not supply any signal to VIDEO INPUT terminal.

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 3 | DARK CLIP AND WHITE CLIP | Colour bar from Colour bar generator | E-E | TP1002 (IC1001 ⑳ pin) | SVR1005 (DARK CLIP)<br>SVR1002 (WHITE CLIP) |  <br>1. Adjust SVR1005 so that the dark peak is 50 $^{+0}_{-5}$ %.<br>2. Adjust SVR1002 so that the white peak is 190 $^{+0}_{-5}$ %. |
| 4 | CARRIER SET | None NOTE (3) | E-E | TP1006 (CN1001) ⑥ | SVR1003 | 1. Set the TU/AV button to the AV position and but the VCR in the no-signal stop mode.<br>2. Adjust SVR1003 so that the frequency is 3.80 ±0.05 MHz. |
| 5 | DEVIATION | Colour bar from Colour bar generator | REC (Adjustment)<br>⬇<br>PLAY (Check) | TP1001 | SVR1004 |  <br>1. Playback the recorded part, and check that the level is 1.00 ±0.05Vp-p.<br>2. If the level is not 1.00 ±0.05Vp-p, adjust SVR1004, record and playback it until the value is satisfied. |
| 6 | VXO | Brank tape | PLAY | TP1007 | SVR1201 | Adjust SVR1201 so that the frequency is 4433619 ±20Hz. |
| 7 | CCD LEVEL | Colour bar from Colour bar generator | E-E | TP1003 (IC1001 ⑧ pin)<br>TP1004 (IC1001 ⑨ pin) | SVR1121 | <br>Adjust SVR1121 so that the same level of TP1003 and TP1004 waveforms. |
| 8 | CHROMINANCE SIGNAL RECORDING CURRENT | Colour bar from Colour bar generator | REC | CN1603③ (HOT)<br>CN1603① (GND) | SVR1202 |  <br>1. Turn SVR1001 all the way to the right, looking from the parts side.<br>2. Adjust SVR1202 so that the level is 29 ±2 m Vp-p. |

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 9 | LUMINANCE SIGNAL RECORDING CURRENT | B/W signal from Colour bar generator | REC | CN1603 ③ (HOT)<br>CN1603 ① (GND) | SVR1001 |  Adjust SVR1001 so that the level is 115 ±5 m Vp-p.  |

## 2-4. AUDIO CIRCUIT ADJUSTMENT ... VD-1 Board

NOTE (1): No-signal record mode is do not supply any signal to AUDIO INPUT terminal.
*NOTE (2): Adjustment No. 2 is unnecessary for VHR-3300EE, VHR-3300SP and VHR-3300.
*NOTE (3): Adjustment No. 3 is unnecessary for VHR-3300G, VHR-3300EX and VHR-3300E. X

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | BIAS | None | REC | TP2004<br>TP2005 (GND) | SVR2001 | 1. Set the input TUNER/EXT IN selector to the EXT IN position and put the VCR in the no-signal record mode.<br>2. Adjust SVR2001 so that the level is 24 mV rms. (72 mV P.P) |
| 2 | PLAYBACK OUTPUT LEVEL NOTE (1), (2) | Audio signal (1 KHz, –3.8 dBs) from Audio signal generator | REC ⬇ PLAY | AUDIO OUT terminal CN1005 ① | SVR2002 | Adjust SVR2002 so that the recorded 1 KHz output level becomes –3.8 dBs in the PLAY mode. |
| X 3 | PLAYBACK OUTPUT LEVEL NOTE (2), (3) | Audio signal (1 KHz, –20 dBs) from Audio signal generator | REC ⬇ PLAY | AUDIO OUT terminal | SVR2002 | Adjust SVR2002 so that the recorded 1 KHz output level becomes –8 dBs in the PLAY mode. X |

## 2-5. TUNER IF CIRCUIT ADJUSTMENT

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | RF AGC | TV broadcast | E-E | TV screen | SVR6001 | Turn SVR6001 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears. |

## 2-6. TEST POINT & ADJUSTMENT LOCATION

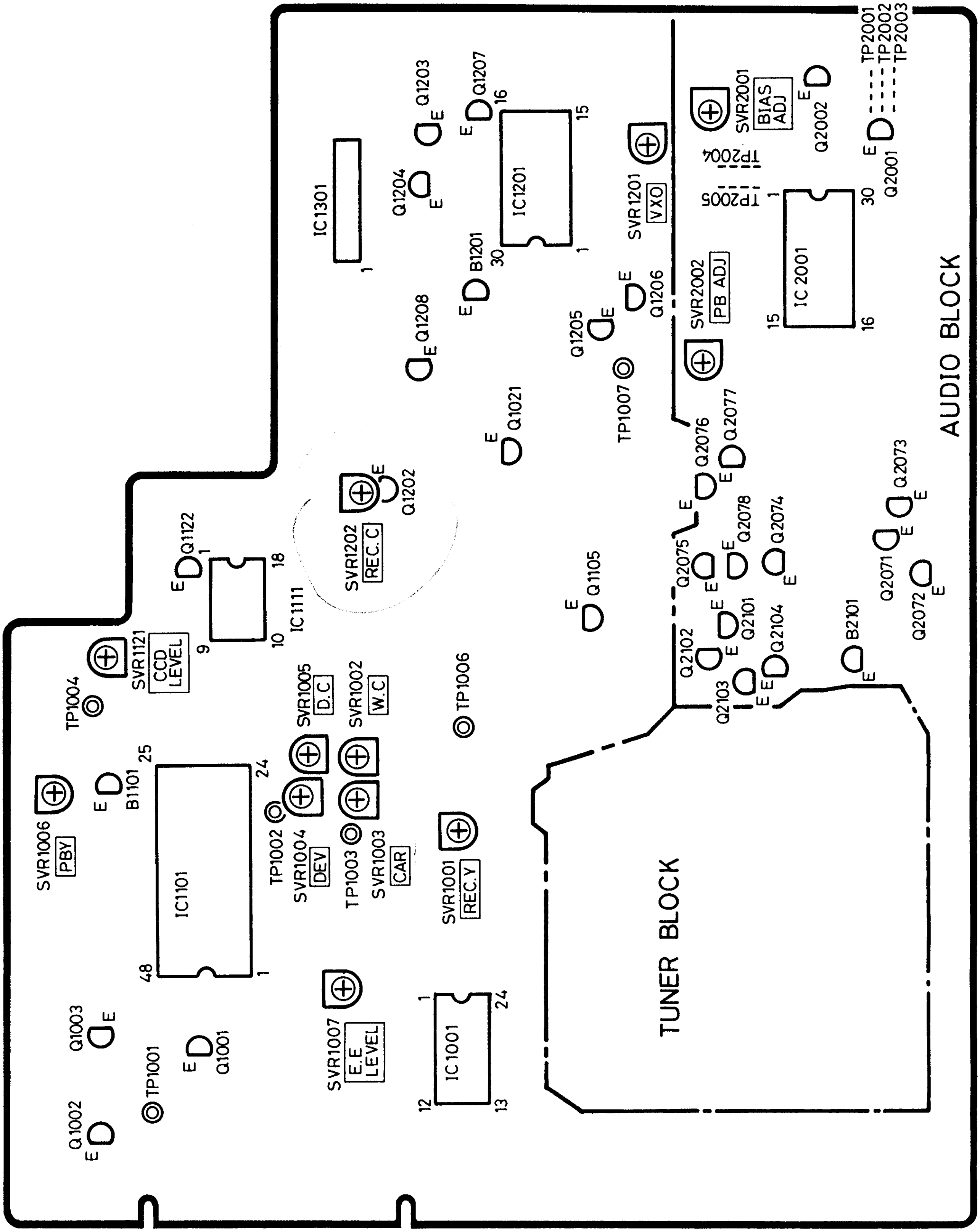

IC1301
Q1203
Q1207
Q1204
IC1201
SVR1201
VXO
SVR2001
BIAS ADJ
Q2002
TP2001
TP2002
TP2003
Q2001
TP2004
TP2005
IC 2001
SVR2002
PB ADJ
Q1206
Q1205
B1201
Q1208
TP1007
Q1021
Q2076
Q2077
AUDIO BLOCK
Q2073
Q1202
SVR1202
REC.C
Q1122
IC1111
Q1105
Q2075
Q2078
Q2074
Q2071
Q2072
Q2102
Q2101
Q2104
B2101
Q2103
SVR1121
CCD LEVEL
TP1004
SVR1005
D.C
SVR1002
W.C
TP1006
SVR1006
PBY
B1101
IC1101
TP1002
SVR1004
DEV
TP1003
SVR1003
CAR
SVR1001
REC.Y
TUNER BLOCK
SVR1007
E.E LEVEL
IC1001
Q1003
Q1001
TP1001
Q1002

Fig. 2-6-1 VD-1 Board (Parts side view)

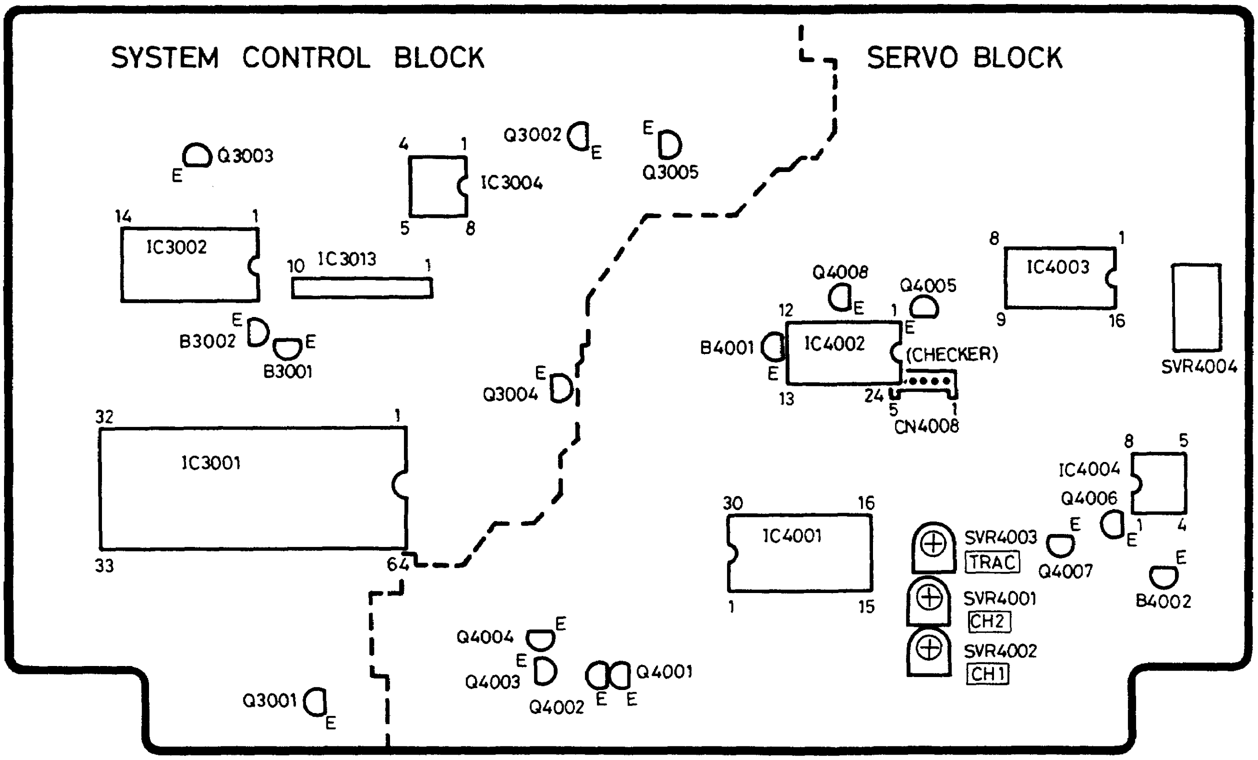

SYSTEM CONTROL BLOCK
SERVO BLOCK
Q3003
E
Q3002
E
Q3005
IC3004
IC3002
IC3013
B3002
B3001
Q3004
IC3001
Q3001
Q4004
Q4003
Q4002
Q4001
Q4008
Q4005
B4001
IC4002
(CHECKER)
CN4008
IC4003
SVR4004
IC4004
Q4006
IC4001
SVR4003
TRAC
Q4007
B4002
SVR4001
CH2
SVR4002
CH1

**Fig. 2-6-2 SY-1 Board (Parts side view)**

**SANYO Electric Co., Ltd.**
**OSAKA, JAPAN**
May/'87/6000HA Printed in Japan

PARTS LIST &
CIRCUIT DIAGRAMS

SANYO

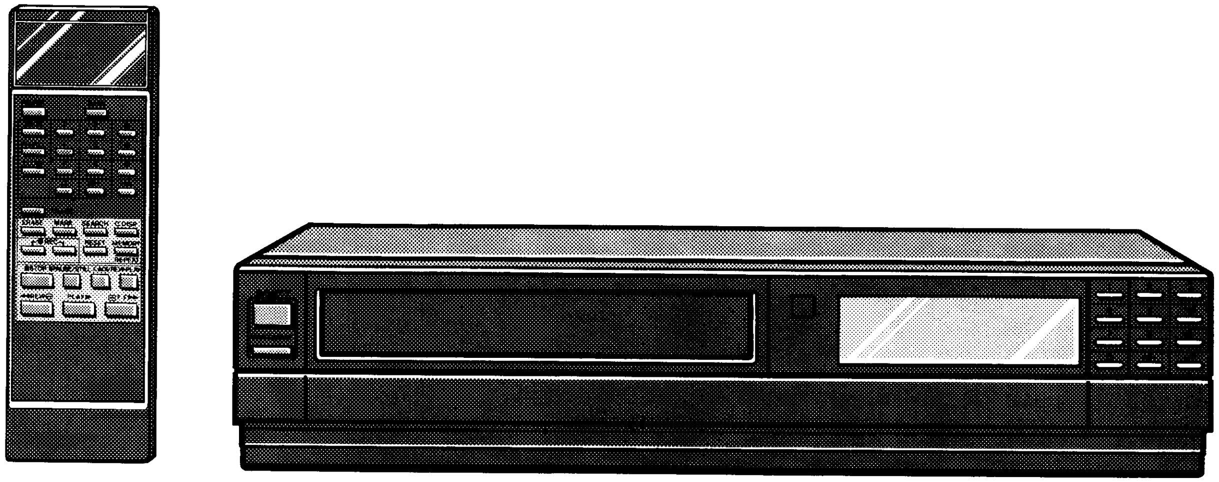
# VHR-3300E

# COLOUR VIDEO CASSETTE RECORDER

VHS HQ
PAL

Please see other materials with Reference No. given in table below.

| Materials | Model No. | Reference No. |
|---|---|---|
| SERVICE MANUAL | VHR-3300 Series | WM-19930 |
| MECHANISM MANUAL | VHR-3300, 3500 Series | WM-19932 |
| TRAINING MANUAL | VHR-3300 Series | WM-19931 |



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CIRCUIT DIAGRAM

**PRODUCT SAFETY NOTICE**

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage and voltage ratings shown.

**NOTE** : Parts order must contain Model Number, Part Number and Description.

BP2/E

REFERENCE No. WM-20447

## ACCESSORIES

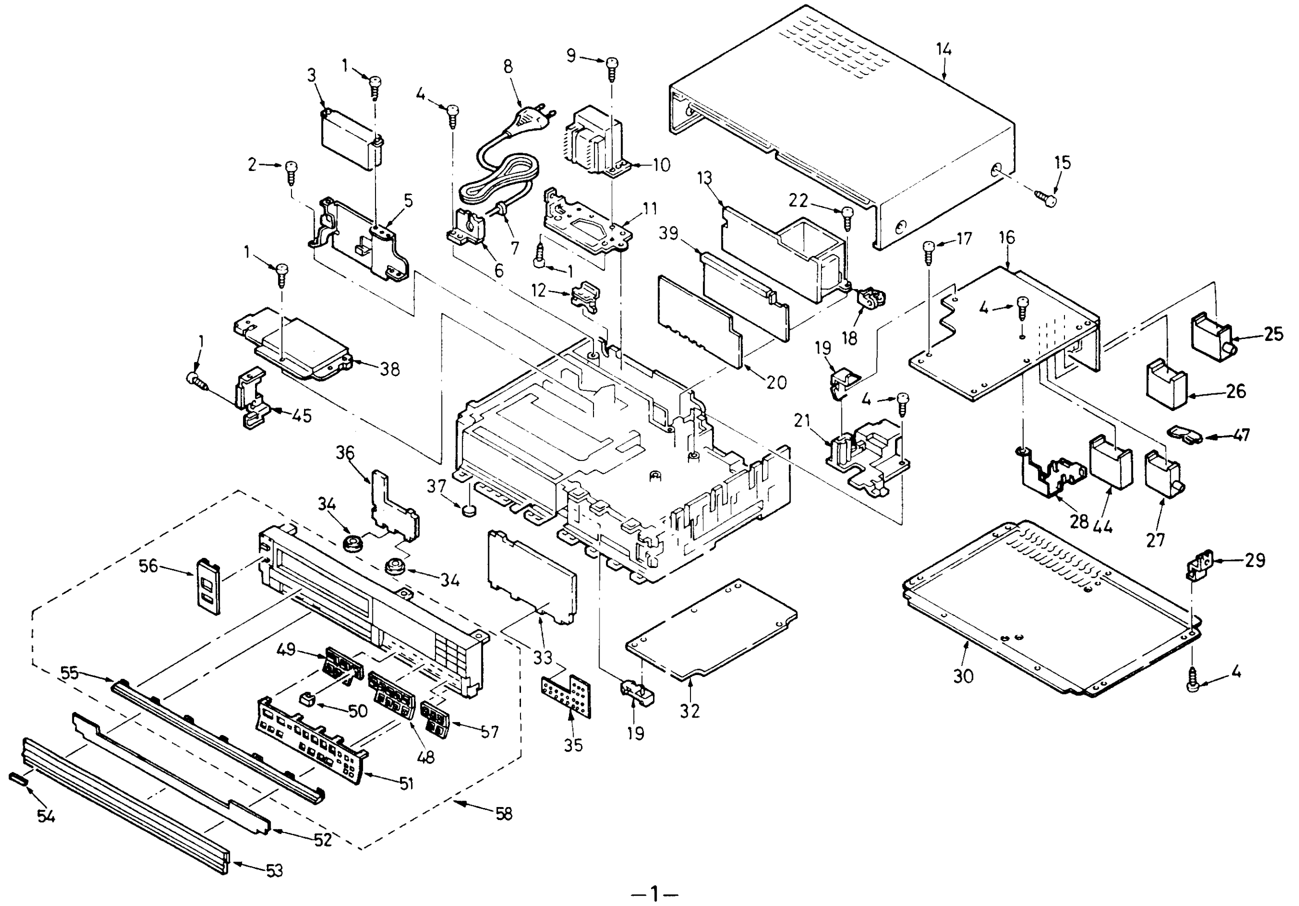
| Ref. No. | Part No. | Description |
|---|---|---|
| | 143-6-411T-93900 | INSTRUCTION MANUAL |
| | 4-243V-40600 | ANTENNA OUTPUT CABLE |
| | 143-9-4100-68900 | REMOTE CONTROL UNIT |
| | 143-6-451T-16200 | GUARANTEE CARD |

## PACKING MATERIALS

| Ref. No. | Part No. | Description |
|---|---|---|
| | 143-6-132T-76321 | INNER CARTON |
| | 143-6-251T-16600 | INDIVIDUAL POLY.COVER |
| | 143-6-144T-18900 | PAD,FRONT |
| | 143-6-144T-19000 | PAD,REAR |

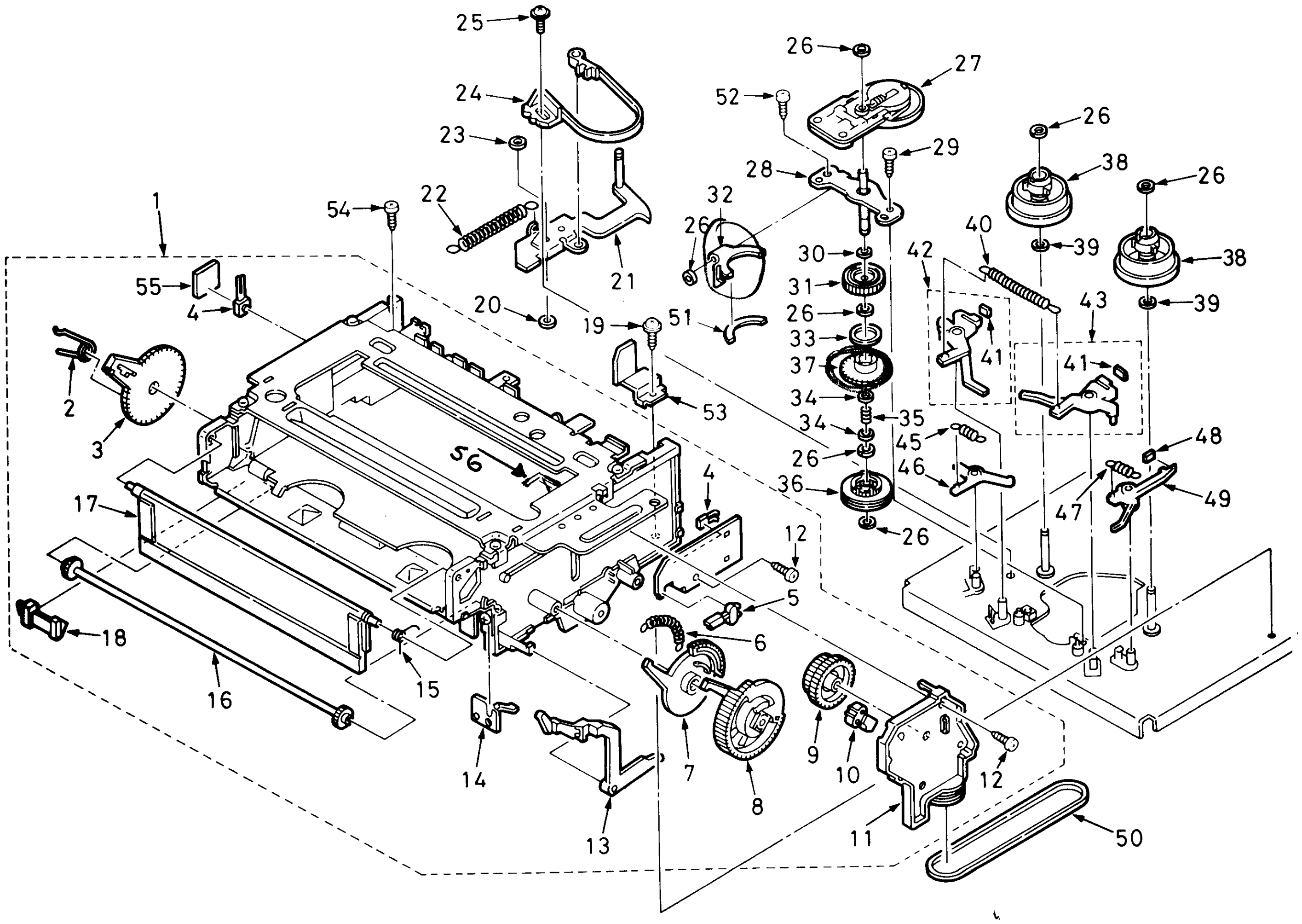
## CABINET & CHASSIS PARTS

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 411 021 6405 | SCR S-TPG BIN 3X8 |
| 2 | 411 001 8900 | SCR BIN 3X8 |
| 3 | 143-0-233V-47500 | VP-1 BOARD ASSEMBLY |
| 4 | 411 021 4005 | SCR S-TPG BIN 3X12 |
| 5 | 143-2-351T-79400 | BRACKET,VP-1 BOARD |
| 6 | 143-2-310T-08200 | BRACKET,POWER CORD |
| 7 | 143-2-464T-02700 | FIXER,POWER CORD |
| 8 | ⚠ 4-243V-12932 | POWER CORD |
| 9 | 411 021 9109 | SCR S-TPG BIN 4X6 |
| 10 | ⚠ 4-251V-63121 | POWER TRANSFORMER |
| 11 | 143-2-371T-02200 | BRACKET,POWER TRANSFORMER |
| 12 | 143-2-210T-09900 | BRACKET,POWER CORD |
| 13 | 143-0-233V-43575 | PW-1 BOARD ASSEMBLY |
| 14 | 143-2-111T-10001 | CABINET |
| 15 | 412 020 9909 | SPECIAL SCREW |
| 16 | 143-0-233V-51222 | VD-1 BOARD ASSEMBLY |
| 17 | 411 021 4203 | SCR S-TPG BIN 3X12 |
| 18 | 143-2-352T-24000 | SPACER,HEAT SINK |
| 19 | 143-2-251T-01400 | HINGE |
| 20 | 143-2-322T-88600 | SHIELD PLATE |
| 21 | 143-2-210T-10100 | BRACKET |
| 22 | 411 021 4302 | SCR S-TPG BIN 3X14 |
| 25 | 143-9-4300-84600 | RF CONVERTER 613-073-3656 |
| 26 | 143-0-233V-41000 | TN-1 BOARD ASSEMBLY |
| 27 | 4-115V-24700 | TUNER |
| 28 | 143-2-359T-02900 | BRACKET,TUNER |
| 29 | 143-2-310T-08500 | BRACKET,CABINET |
| 30 | 143-2-125T-09300 | BOTTOM PLATE |
| 32 | 143-0-233V-46700 | SY-1 BOARD ASSEMBLY |
| 33 | 143-0-233V-49421 | TM-4 BOARD ASSEMBLY |
| 34 | 143-2-163T-08000 | ROTARY KNOB |
| 35 | 143-2-161T-82100 | PUSH BUTTON,TM-4 BOARD |
| 36 | 143-0-233V-49500 | TM-5 BOARD ASSEMBLY |
| 37 | 143-2-174T-02402 | STAND |
| 38 | 143-2-322T-85800 | UPPER SHIELD PLATE 84-1272 |
| 39 | 143-2-327T-14300 | INSULATOR,PW-1 BOARD |
| 44 | 143-0-233V-49127 | TN-2 BOARD ASSEMBLY |
| 45 | 143-2-351T-80100 | BRACKET,SHIELD PLATE |
| 47 | 143-2-853T-18800 | SPRING PLATE |
| 48 | 143-2-161T-81810 | BUTTON, TIMER |
| 49 | 143-2-161T-81700 | BUTTON, OPERATION |
| 50 | 143-2-161T-82000 | BUTTON, REC |
| 51 | 143-2-143T-87300 | PLATE |
| 52 | 143-2-245T-00200 | BACK PLATE, COVER |
| 53 | 143-2-153T-26502 | TIMER COVER |
| 54 | 143-2-142T-06600 | BADGE |
| 55 | 143-2-152T-05210 | SASH |
| 56 | 143-2-153T-23100 | PLATE |
| 57 | 143-2-161T-81900 | BUTTON, TUNING |
| 58 | 143-9-122T-26311 | FRONT PANEL ASSEMBLY |



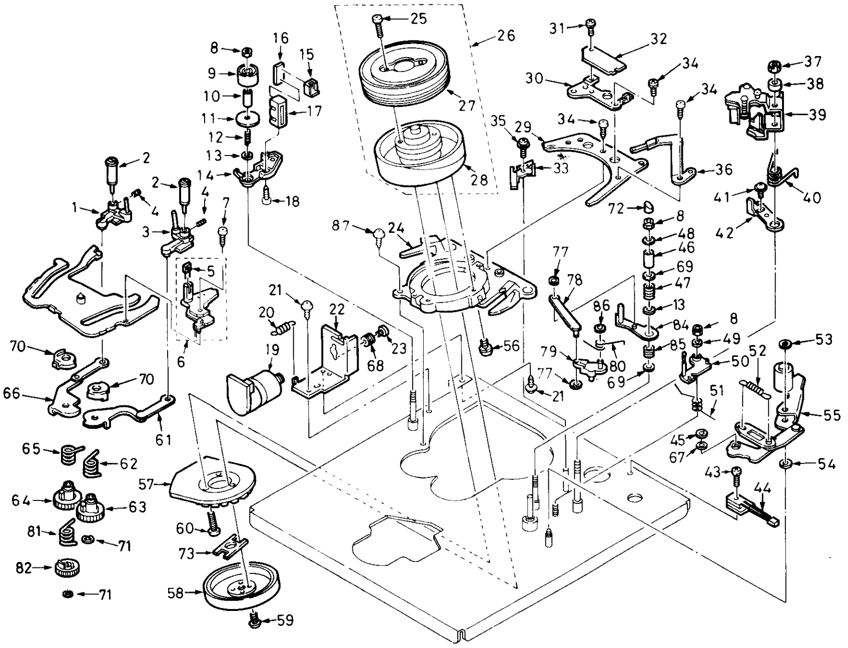
## MECHANISM PARTS(1)

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 143-9-351T-78551 | FRONT MECHANISM ASSY |
| 2 | 143-2-851T-89900 | SPRING COIL |
| 3 | 143-2-581T-15600 | GEAR |
| 4 | SPPN150SAN+++ | PHOTO SENSOR PN150SAN |
| 5 | 4-231V-86900 | SPECIAL SWITCH |
| 6 | 143-2-851T-89800 | SPRING COIL |
| 7 | 143-2-581T-15500 | GEAR |
| 8 | 143-2-581T-15400 | GEAR |
| 9 | 143-2-581T-15800 | GEAR |
| 10 | 4-231V-87100 | SPECIAL SWITCH |
| 11 | 143-0-351T-78300 | BRACKET MTG ASSY |
| 12 | 411 021 6405 | SCR S-TPG BIN 3X8 |
| 13 | 143-2-741T-64500 | LEVER |
| 14 | 143-2-853T-18200 | SPRING PLATE |
| 15 | 143-2-851T-90000 | SPRING COIL 63-0802 |
| 16 | 143-0-751T-99200 | SHAFT ASSY |
| 17 | 143-2-133T-24418 | COMPARTMENT LID |
| 18 | 4-231V-87000 | SPECIAL SWITCH |
| 19 | 411 036 3208 | SCR PAN+SW+W+W 3X10 |
| 20 | 412 012 8309 | WASHER 4.1X6.5X0.5T |
| 21 | 143-0-741T-65200 | LEVER ASSY |
| 22 | 143-2-851T-87700 | SPRING COIL |
| 23 | 412 029 4903 | SPECIAL WASHER 0.6T |
| 24 | 143-0-711T-02100 | BRAKE BAND ASSY |
| 25 | 411 046 9702 | SCR PAN+SW+W 3X6 |
| 26 | 412 015 9600 | SPECIAL WASHER 63-0825 |
| 27 | 143-0-662T-15621 | ROLLER ASSY 29-1569 |
| 28 | 143-0-351T-76900 | BRACKET MTG ASSY |
| 29 | BJN2S++310+ZK | PAN HEAD 2 TAPING SCREW S 3X10 |
| 30 | 412 015 8900 | SPECIAL WASHER 3.1X6X0.4T |
| 31 | 143-2-661T-72800 | PULLEY |
| 32 | 143-2-741T-62100 | LEVER |
| 33 | 143-2-457T-17400 | SPECIAL WASHER 0.5T |
| 34 | 412 015 8702 | SPECIAL WASHER D3.1XD6X0.13T 63-1401 |
| 35 | 143-2-851T-86800 | SPRING COIL |
| 36 | 143-2-661T-72701 | PULLEY |
| 37 | 143-2-581T-13700 | GEAR - |
| 38 | 143-0-531T-05421 | REEL PLATE ASSY |
| 39 | 412 015 8504 | SPECIAL WASHER D3.1XD6X0.5T |
| or | 412 015 8603 | SPECIAL WASHER D3.1XD6X0.25T |
| or | 412 015 8702 | SPECIAL WASHER D3.1XD6X0.13T |
| or | 412 015 8801 | SPECIAL WASHER 0.2T |
| or | 412 015 8900 | SPECIAL WASHER 3.1X6X0.4T |
| or | 412 021 5306 | WASHER D3.1XD6X0.3T |
| 40 | 143-2-851T-87600 | SPRING COIL |
| 41 | 143-2-712T-05200 | BRAKE SHOE 63-902 |
| 42 | 143-0-741T-62200 | LEVER ASSY |
| 43 | 143-0-741T-62300 | LEVER ASSY |
| 45 | 143-2-851T-92500 | SPRING COIL |
| 46 | 143-2-741T-63400 | LEVER |
| 47 | 143-2-851T-92100 | SPRING COIL |
| 48 | 143-2-712T-05500 | BRAKE SHOE |
| 49 | 143-2-741T-62600 | LEVER |
| 50 | 143-2-564T-05300 | SQUARE BELT |
| 51 | 143-2-246T-45500 | SHEET |
| 52 | 411 023 9800 | SCR S-TPG PAN 3X8 |
| 53 | 143-2-351T-80200 | BRACKET MTG |
| 54 | 411 047 7905 | SCR PAN+FLG 3X7 |
| 55 | 143-2-135T-32900 | COVER |
| 56 | 143-2-741T-64700A | CASSETTE FLAP LIFTER |



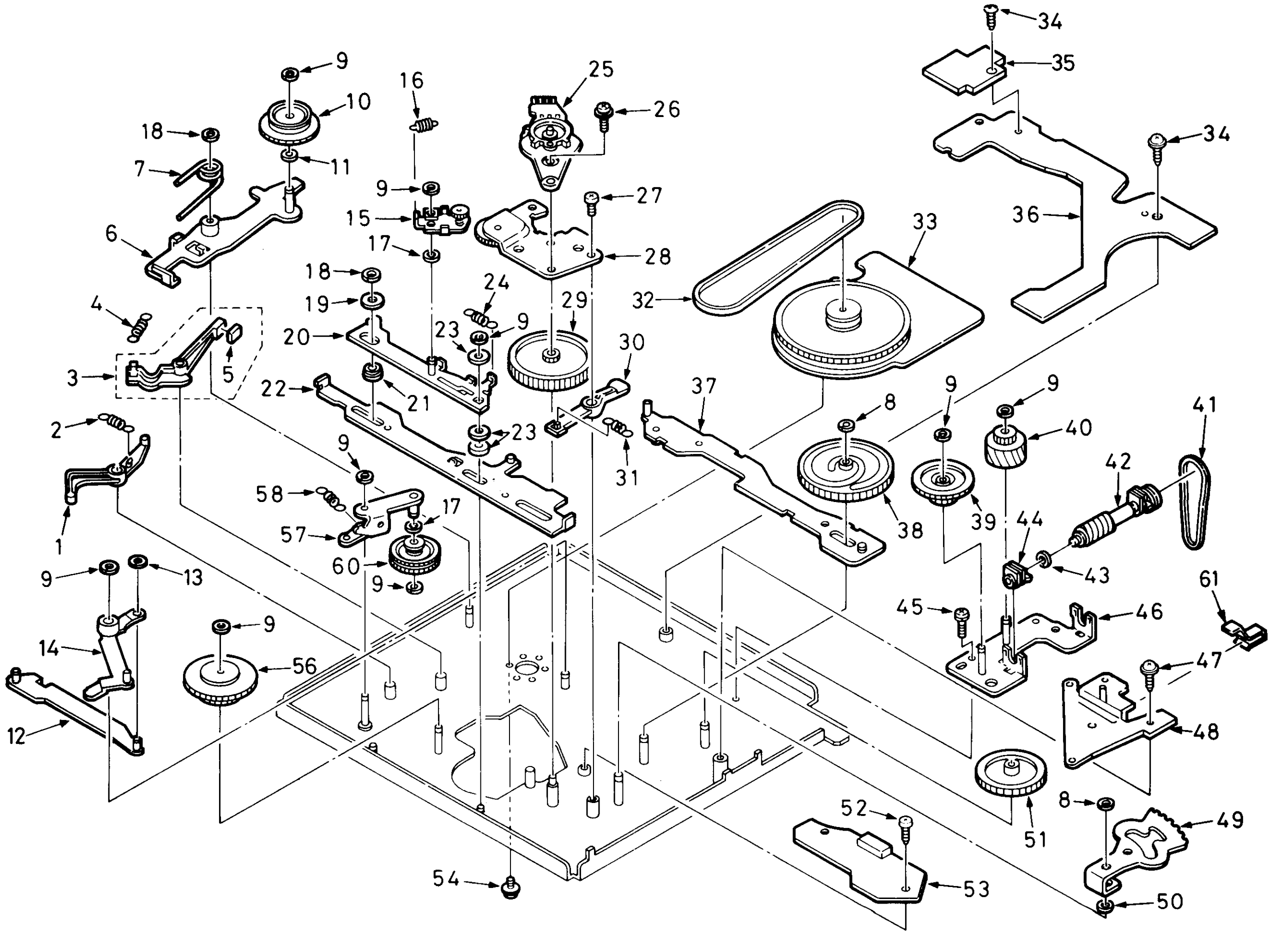
## MECHANISM PARTS(2)

| Location | Part No. | Description |
|---|---|---|
| 1 | 143-9-822T-03021 | BRACKET TAPE GUIDE ASSY |
| 2 | 143-0-821T-14400 | TAPE GUIDE ASSY |
| or | 143-0-821T-14500 | TAPE GUIDE ASSY |
| 3 | 143-0-822T-03121 | BRACKET TAPE GUIDE ASSY |
| 4 | 411 063 0706 | SCR SET HEX-SCT 2X2 |
| 5 | 407 094 2000 | LED LN59SAN |
| 6 | 143-0-351T-79201 | BRACKET MTG ASSY |
| 7 | 412 021 1209 | SPECIAL SCREW |
| 8 | 412 015 8306 | SPECIAL NUT |
| 9 | 143-2-662T-15400 | ROLLER |
| 10 | 143-2-681T-17500 | SLEEVE |
| 11 | 143-2-457T-13420 | SPECIAL WASHER |
| 12 | 143-2-851T-91300 | SPRING COIL |
| 13 | 143-2-451T-17800 | SPECIAL WASHER |
| 14 | 143-2-741T-63700 | LEVER |
| 15 | 4-235V-46502 | SOCKET 2P |
| 16 | 4-233V-26300 | P C BOARD |
| 17 | 4-242V-24700 | MAGNETIC HEAD |
| 18 | 411 002 4901 | SCR PAN 2X4 |
| 19 | 143-9-527V-03020 | COMMUTATE MOTOR ASSY |
| or | 4-527V-03010 | COMMUTATE MOTOR ASSY |
| 20 | 143-2-851T-89200 | SPRING COIL |
| 21 | 411 047 6809 | SCR PAN+FLG 3X4 |
| or | 411 047 8100 | SCR PAN+FLG 3X8 |
| 22 | 143-2-378T-02901 | BRACKET MOTOR |
| 23 | 412 021 1407 | SPECIAL SCREW |
| 24 | 143-2-776T-02500 | BRACKET CYLINDER |
| 25 | 411 037 6208 | SCR PAN+W 3X8 |
| 26 | 143-0-771T-09020 | CYLINDER ROTARY HEAD ASSY |
| 27 | 143-0-771T-09000 | CYLINDER ASSY, UPPER |
| 28 | 143-0-771T-08900 | CYLINDER ASSY, LOWER |
| 29 | 143-2-351T-77500 | BRACKET MTG |
| 30 | 143-2-377T-21700 | BRACKET P C BOARD |
| 31 | 411 003 8809 | SCR PAN+SW 2.6X6 |
| 32 | 143-0-233V-35500 | MC30 ASSY |
| 33 | 143-2-351T-80000 | BRACKET MTG |
| or | 143-2-351T-80001 | BRACKET MTG |
| 34 | 411 003 8908 | SCR PAN+SW 3X6 |
| 35 | 411 020 9902 | SCR S-TPG BRZ+FLG 3X8 |
| or | 411 020 8905 | SCR S-TPG BRZ+FLG 3X10 |
| 36 | 143-0-324T-00925 | EARTH PLATE ASSY |
| 37 | 412 015 8207 | SPECIAL NUT |
| 38 | 143-2-352T-22800 | SPACER |
| 39 | 143-9-242V-27500 | MAGNETIC HEAD ASSY |
| 40 | 143-2-851T-89500 | SPRING COIL |
| 41 | 411 036 5301 | SCR PAN+SW+W 3X6 |
| 42 | 143-2-375T-11000 | BRACKET HEAD |
| 43 | 411 046 9702 | SCR PAN+SW+W 3X6 |
| 44 | 4-221V-18900 | RESISTOR,DEW |
| 45 | 412 029 4903 | SPECIAL WASHER 0.6T |
| 46 | 143-2-821T-14100 | TAPE GUIDE |
| 47 | 143-2-851T-91300 | SPRING COIL |
| 48 | 143-2-457T-17500 | SPECIAL WASHER |
| 49 | 412 015 8504 | SPECIAL WASHER D3.1XD6X0.5T |
| 50 | 143-0-741T-63300 | LEVER ASSY |
| 51 | 143-2-851T-87900 | SPRING COIL |
| 52 | 143-2-851T-87800 | SPRING COIL |
| 53 | 412 021 5207 | SPECIAL WASHER 0.7T |
| 54 | 412 012 9108 | WASHER 5.2X8.0X0.5T |
| 55 | 143-0-545T-02830 | PINCH ROLER |
| 56 | 411 045 5408 | SCR PAN+SW 3X5 |
| 57 | 4-264V-17400 | MAGNETIC COIL |
| 58 | 143-2-774T-03110 | ROTOR |
| 59 | 411 044 9001 | SCR PAN+SW 2.3X6 |
| 60 | BJX2S2R310+Z1 | PAN SCREW+SP WASHER S 2.3 |
| 61 | 143-0-741T-64122 | LEVER ASSY |
| 62 | 143-2-851T-89000 | SPRING COIL |
| 63 | 143-2-581T-15200 | GEAR |
| 64 | 143-2-581T-16400 | GEAR |
| 65 | 143-2-851T-90700 | SPRING COIL |
| 66 | 143-0-741T-64222 | LEVER ASSY |
| 67 | 412 012 8309 | WASHER 4.1X6.5X0.5T |
| 68 | 143-2-445T-21300 | RUBBER CUSHION |
| 69 | 412 021 7102 | SPECIAL WASHER D3XD6.5X1T |
| or | 412 021 8901 | SPECIAL WASHER D3XD6.5X1T |
| 70 | 143-2-352T-23500 | SPACER |
| 71 | 411 000 9908 | RING E 3 U 3 |
| 72 | 143-2-681T-21100 | SLEEVE |
| 73 | 143-2-352T-23300 | SPACER 0.3T |
| 77 | 412 015 9600 | SPECIAL WASHER |
| 78 | 143-0-741T-66000 | LEVER ASSY |
| 79 | 143-0-741T-66100 | LEVER ASSY 63-901 |
| 80 | 143-2-851T-91200 | SPRING COIL |
| 81 | 143-2-851T-90800 | SPRING COIL |
| 82 | 143-2-581T-16500 | GEAR |
| 84 | 143-0-741T-65900 | LEVER ASSY |
| 85 | 143-2-851T-92400 | SPRING COIL |
| 86 | 143-2-457T-17700 | SPECIAL WASHER |
| 87 | 411 047 5307 | SCR PAN+FLG 3X10 |



## MECHANISM PARTS(3)

| Location | Part No. | Description |
|---|---|---|
| 1 | 143-2-741T-62501 | LEVER |
| 2 | 143-2-851T-88800 | SPRING COIL |
| 3 | 143-0-741T-65100 | LEVER ASSY |
| 4 | 143-2-851T-87100 | SPRING COIL |
| 5 | 143-2-712T-05301 | BRAKE SHOE |
| 6 | 143-0-741T-65800 | LEVER ASSY |
| 7 | 143-2-851T-91100 | SPRING COIL |
| 8 | 143-2-457T-17100 | SPECIAL WASHER 0.7T |
| 9 | 412 015 9600 | SPECIAL WASHER |
| 10 | 143-0-581T-16601 | GEAR ASSY |
| 11 | 412 012 7708 | SPECIAL WASHER 3X5.4X0.5T |
| or | 412 015 8504 | SPECIAL WASHER D3.1XD6X0.5T |
| 12 | 143-0-741T-65600 | LEVER ASSY |
| 13 | 412 015 9501 | SPECIAL WASHER |
| 14 | 143-0-741T-65700 | LEVER ASSY |
| 15 | 143-0-741T-62921 | LEVER ASSY |
| 16 | 143-2-851T-87500 | SPRING COIL |
| 17 | 412 015 8504 | SPECIAL WASHER D3.1XD6X0.5T |
| 18 | 412 029 4903 | SPECIAL WASHER 0.6T |
| 19 | 143-2-457T-12600 | SPECIAL WASHER |
| 20 | 143-0-731T-16300 | SLIDE ASSY |
| 21 | 143-2-681T-19800 | SLEEVE |
| 22 | 143-0-731T-16400 | SLIDE ASSY |
| 23 | 143-2-457T-13700 | SPECIAL WASHER |
| 24 | 143-2-851T-87400 | SPRING COIL |
| 25 | 4-231V-87400 | SPECIAL SWITCH |
| 26 | 411 036 2805 | SCR PAN+SW+W 2.6X6 |
| 27 | 411 024 4309 | SCR S-TPG PAN+FLG 2.6X8 |
| or | 411 024 4101 | SCR S-TPG PAN+FLG 2.6X6 |
| 28 | 143-0-581T-14300 | GEAR ASSY |
| 29 | 143-2-581T-16100 | GEAR |
| 30 | 143-2-741T-63600 | LEVER |
| 31 | 143-2-851T-89600 | SPRING COIL |
| 32 | 143-2-564T-05001 | SQUARE BELT |
| 33 | 4-527V-54500 | BRUSHLESS MOTOR |
| 34 | 411 023 4003 | SCR S-TPG PAN 3X10 |
| 35 | 143-2-210T-09600 | BRACKET |
| 36 | 143-0-233V-26750 | MC2 ASSY |
| 37 | 143-0-731T-16600 | SLIDE ASSY |
| 38 | 143-2-581T-16000 | GEAR |
| 39 | 143-2-581T-14600 | GEAR |
| 40 | 143-2-581T-14500 | GEAR |
| 41 | 143-2-564T-04900 | SQUARE BELT |
| 42 | 143-0-581T-14400 | GEAR ASSY |
| 43 | 412 012 7708 | WASHER 3X5.4X0.5 |
| 44 | 143-2-681T-19900 | SLEEVE |
| 45 | 411 045 6702 | SCR PAN+SW 3X8 |
| 46 | 143-0-351T-77200 | BRACKET MTG ASSY |
| 47 | BJXWS2R6+8+Z1 | PAN HEAD B+WASHER HEAD S 2.6X8 |
| 48 | 143-2-351T-79600 | BRACKET MTG |
| 49 | 143-0-581T-16300 | GEAR ASSY |
| 50 | 412 012 8309 | WASHER 4.1X6.5X0.5T |
| 51 | 143-2-581T-14700 | GEAR |
| 52 | 411 023 9800 | SCR S-TPG PAN 3X8 |
| 53 | 143-0-233V-26621 | MC1 ASSY |
| 54 | 411 047 6809 | SCR PAN+FLG 3X4 |
| 56 | 143-0-581T-14001 | GEAR ASSY |
| 57 | 143-0-741T-62800 | LEVER ASSY |
| 58 | 143-2-851T-87300 | SPRING COIL |
| 60 | 143-0-581T-13801 | GEAR ASSY |
| 61 | 143-2-324T-01100 | EARTH PLATE |



112-054-7819
7002

# ELECTRICAL PARTS

**NOTE:**

* Materials of Capacitors are abbreviated as follows;

| | |
|---|---|
| ALUMINUM | Aluminum Electrolytic Capacitor |
| BC CON | Barrier Layer Ceramic Capacitor |
| CERAMIC | Ceramic Capacitor |
| EDL | Electric Double Layer Capacitor |
| ELECT | Electrolytic Capacitor |
| MYLAR | Mylar Film Capacitor |
| NON POLARIZED | Non Polarized Electrolytic Capacitor |
| POLYPRO | Polypropylene Capacitor |

* Tolerance of Capacitor, Resistors and Other parts are noted with follow symboles;

| | |
|---|---|
| A | +75-10% |
| F | ±1% |
| G | ±2% |
| J | ±5% |
| K | ±10% |
| M | ±20% |
| N | ±30% |
| P | +100-0% |
| Z | +80-20% |

## VD-1 BOARD (VIDEO)
## NO. 143-0-233V-51222

| Location | Part No. | Description |
|---|---|---|
| | 143-2-377T-21800 | TERMINAL BOARD |
| | 143-2-143T-83520 | SHEET,JACKS |
| | 143-2-143T-81900 | SHEET,RF CONVERTER |
| | 143-2-464T-07700 | FIXER,VD-1 BOARD |
| | | **(COMPOSITE)** |
| B1101 | 405 003 7603 | TR 2SA1345 |
| or | 405 001 1306 | TR RN2204 |
| B1201 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |
| | | **(CAPACITORS)** |
| C1001 | 403 039 3507 | ELECT 470MF M 6.3V |
| C1002 | 403 042 2405 | ELECT 100MF M 16V |
| C1003 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1005 | 403 043 9106 | ELECT 47MF M 16V |
| C1006 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1007 | 403 024 1501 | CERAMIC 39PF J 50V |
| C1008 | 403 038 6202 | ELECT 22MF M 6.3V |
| C1034 | 403 042 2405 | ELECT 100MF M 16V |
| C1035 | 403 041 2109 | ELECT 47MF M 10V |
| C1036 | 403 041 2109 | ELECT 47MF M 10V |
| C1037 | 403 001 2903 | CERAMIC 0.1MF M 16V |
| C1038 | 403 041 8804 | ELECT 10MF M 16V |
| C1040 | 403 041 8804 | ELECT 10MF M 16V |
| C1041 | 403 049 0008 | ELECT 1MF M 50V |
| C1042 | 403 049 0008 | ELECT 1MF M 50V |
| C1051 | 403 042 2405 | ELECT 100MF M 16V |
| C1052 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1101 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1102 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1103 | 403 028 3402 | CERAMIC 56PF J 50V |
| C1104 | 403 074 9205 | CERAMIC 680PF K 50V |
| C1105 | 403 047 0604 | ELECT 4.7MF M 25V |
| C1106 | 403 039 2609 | ELECT 47MF M 6.3V |
| C1107 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1108 | 403 051 1307 | ELECT 4.7MF M 50V |
| C1109 | 403 071 6207 | CERAMIC 220PF K 50V |
| C1110 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1111 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1112 | 403 001 8004 | CERAMIC 0.047MF M 16V |
| C1113 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1114 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1115 | 403 049 9803 | ELECT 2.2MF M 50V |
| C1116 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C1119 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1120 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C1121 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1122 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1123 | 403 050 6600 | ELECT 3.3MF M 50V |
| C1124 | 403 050 7003 | ELECT 3.3MF M 50V |
| C1125 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1126 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1127 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1128 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1129 | 403 071 2001 | CERAMIC 180PF K 50V |
| C1130 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1131 | 403 048 6308 | ELECT 0.47MF M 50V |
| C1132 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1133 | 403 073 2702 | CERAMIC 390PF J 50V |
| C1134 | 403 073 7004 | CERAMIC 470PF K 50V |
| C1135 | 403 072 4707 | CERAMIC 270PF K 50V |
| C1136 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1137 | 403 014 2600 | CERAMIC 18PF J 50V |
| C1140 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1141 | 403 026 2209 | CERAMIC 47PF J 50V |
| C1142 | 403 073 7004 | CERAMIC 470PF K 50V |
| C1143 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1145 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1146 | 403 030 6309 | CERAMIC 68PF J 50V |
| C1153 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1154 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1155 | 403 038 9708 | ELECT 330MF M 6.3V |
| C1157 | 403 070 4105 | CERAMIC 120PF K 50V |
| C1161 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1162 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1163 | 403 041 2109 | ELECT 47MF M 10V |
| C1166 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1167 | 403 014 2600 | CERAMIC 18PF J 50V |
| C1168 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1174 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1175 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1176 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1177 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1178 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1179 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C1180 | 403 001 8004 | CERAMIC 0.047MF M 16V |
| C1181 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C1182 | 403 026 2209 | CERAMIC 47PF J 50V |
| C1183 | 403 028 3402 | CERAMIC 56PF J 50V |
| C1201 | 403 026 0700 | CERAMIC 47PF J 50V |
| C1202 | 403 049 0008 | ELECT 1MF M 50V |
| C1203 | 403 001 7007 | CERAMIC 3900PF K 16V |
| C1204 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1205 | 403 049 0008 | ELECT 1MF M 50V |
| C1206 | 403 059 6007 | POLYESTER 0.022MF K 50V |
| C1207 | 403 023 9607 | CERAMIC 39PF J 50V |
| C1208 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1209 | 403 027 9405 | CERAMIC 51PF J 50V |
| C1210 | 403 017 4304 | CERAMIC 200PF J 50V |
| C1211 | 403 049 0008 | ELECT 1MF M 50V |
| C1213 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1214 | 403 049 0008 | ELECT 1MF M 50V |
| C1216 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1218 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1223 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1224 | 403 049 0008 | ELECT 1MF M 50V |

| Location | Part No. | Description |
|---|---|---|
| C1225 | 403 019 9703 | CERAMIC 27PF J 50V |
| C1231 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1232 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1234 | 403 071 6207 | CERAMIC 220PF K 50V |
| C1235 | 403 033 4203 | CERAMIC 82PF J 50V |
| C1237 | 403 070 4105 | CERAMIC 120PF K 50V |
| C1241 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1242 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1243 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1244 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1245 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1247 | 401 020 0702 | CARBON 470 JA 1/4W |
| C1250 | 403 022 7703 | CERAMIC 33PF J 50V |
| C1252 | 403 003 7104 | CERAMIC 0.033MF M 25V |
| C1253 | 403 049 0008 | ELECT 1MF M 50V |
| C1254 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1256 | 403 114 3705 | CERAMIC 0.1MF Z 50V |
| C1257 | 403 114 3705 | CERAMIC 0.1MF Z 50V |
| C1260 | 403 041 8804 | ELECT 10MF M 16V |
| C1261 | 403 038 6202 | ELECT 22MF M 6.3V |
| C1262 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1263 | 403 041 8804 | ELECT 10MF M 16V |
| C1264 | 403 043 9106 | ELECT 47MF M 16V |
| | | **(DIODES)** |
| D1001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1031 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1032 | 407 070 8408 | ZENER DIODE GZS9.1Y |
| or | 407 051 8106 | ZENER DIODE GZS9.1Z-BT |
| or | 407 053 8807 | ZENER DIODE MTZ9.1B-T-77 |
| or | 407 053 8906 | ZENER DIODE MTZ9.1C-T-77 |
| D1102 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1104 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1201 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1202 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1203 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| | | **(INTETGRATED CIRCUITS)** |
| IC1001 | 409 114 4407 | IC LA7223 |
| IC1101 | 409 111 9603 | IC AN3230K |
| IC1111 | 409 112 1606 | IC MN3811 |
| IC1201 | 409 074 5803 | IC TA8632N |
| | | **(COILS)** |
| L1001 | 4-253V-97125 | HF CHOKE 100UH |
| L1003 | 4-253V-97125 | HF CHOKE 100UH |
| L1101 | 4-253V-97125 | HF CHOKE 100UH |
| L1102 | 4-253V-97125 | HF CHOKE 100UH |
| L1104 | 4-253V-97123 | HF CHOKE 68UH |
| L1105 | 4-253V-97124 | HF CHOKE 82UH |
| L1106 | 4-253V-97125 | HF CHOKE 100UH |
| L1107 | 4-253V-97126 | HF CHOKE 120UH |
| L1108 | 4-253V-97128 | HF CHOKE 180UH |
| L1109 | 4-253V-74323 | HF CHOKE 18UH |
| L1110 | 4-253V-85915 | HF CHOKE 15UH |
| L1121 | 4-253V-97125 | HF CHOKE 100UH |
| L1122 | 4-253V-97116 | HF CHOKE 18UH |
| L1201 | 4-253V-97125 | HF CHOKE 100UH |
| L1202 | 4-253V-97116 | HF CHOKE 18UH |
| L1205 | 4-253V-97115 | HF CHOKE 15UH |
| L1209 | 4-253V-97118 | HF CHOKE 27UH |
| L1210 | 4-253V-97133 | HF CHOKE 470UH |
| L1240 | 4-253V-97125 | HF CHOKE 100UH |
| L1242 | 4-253V-74328 | HF CHOKE 47UH |

| Location | Part No. | Description |
|---|---|---|
| L1260 | 4-253V-78530 | HF CHOKE 33MH |
| L1261 | 4-253V-97125 | HF CHOKE 100UH |
| | | **(TRANSISTORS)** |
| Q1001 | 405 004 4601 | TR 2SA608-F-SPA |
| Q1003 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1021 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1105 | 405 006 7204 | TR 2SA984K-F |
| Q1122 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1202 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1203 | 405 016 0905 | TR 2SC2839-E-SPA |
| or | 405 015 2504 | TR 2SC2669-O |
| Q1204 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1205 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1206 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1207 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1208 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-DCTP-Q |
| or | 405 011 8500 | TR 2SC1740S-DCTP-R |
| | | **(RESISTORS)** |
| R1001 | 401 022 0700 | CARBON 68 JA 1/4W |
| R1002 | 401 021 1807 | CARBON 560 JA 1/4W |
| R1003 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R1004 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1005 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1006 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1007 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1009 | 401 021 1807 | CARBON 560 JA 1/4W |
| or | 401 012 6903 | CARBON 10K JA 1/4W |
| R1010 | 401 022 6702 | CARBON 75 JA 1/4W |
| R1031 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1032 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1035 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1041 | 401 012 8006 | CARBON 100K JA 1/4W |
| R1042 | 401 022 7600 | CARBON 7.5K JA 1/4W |
| R1043 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R1044 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R1045 | 401 012 8006 | CARBON 100K JA 1/4W |
| R1046 | 401 017 2702 | CARBON 27K JA 1/4W |
| R1047 | 401 014 5102 | CARBON 1.5K JA 1/4W |
| R1048 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1106 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1107 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1108 | 401 021 4907 | CARBON 560K JA 1/4W |
| R1110 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1111 | 401 020 2805 | CARBON 47K JA 1/4W |
| R1112 | 401 018 7508 | CARBON 360 JA 1/4W |
| R1113 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1114 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1115 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1116 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1118 | 401 023 6909 | CARBON 910 JA 1/4W |
| R1120 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1121 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1123 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R1124 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1125 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1129 | 401 017 1705 | CARBON 2.7K JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R1130 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1136 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1137 | 401 016 8408 | CARBON 24K JA 1/4W |
| R1138 | 401 018 2701 | CARBON 330 JA 1/4W |
| R1139 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1142 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1144 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1145 | 401 016 2505 | CARBON 220 JA 1/4W |
| R1147 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1148 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1150 | 401 022 7600 | CARBON 7.5K JA 1/4W |
| R1153 | 401 020 0801 | CARBON 470 JA 1/4W |
| R1162 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R1163 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1171 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1172 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1173 | 401 016 6404 | CARBON 2.2M JA 1/4W |
| R1201 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1202 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1203 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1204 | 401 013 4106 | CARBON 120 JA 1/4W |
| R1205 | 401 012 5708 | CARBON 1K JA 1/4W |
| R1206 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1207 | 401 019 1802 | CARBON 3.9K JA 1/4W |
| R1208 | 401 015 9406 | CARBON 2K JA 1/4W |
| R1209 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1210 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1212 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1213 | 401 018 4804 | CARBON 33K JA 1/4W |
| R1214 | 401 018 0202 | CARBON 300K JA 1/4W |
| R1215 | 401 018 5702 | CARBON 330K JA 1/4W |
| R1216 | 401 017 9206 | CARBON 3K JA 1/4W |
| R1217 | 401 017 9206 | CARBON 3K JA 1/4W |
| R1218 | 401 021 1807 | CARBON 560 JA 1/4W |
| R1222 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R1223 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1224 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1226 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1227 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1228 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1229 | 401 019 0904 | CARBON 390 JA 1/4W |
| R1231 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1234 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1235 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1236 | 401 020 7800 | CARBON 510 JA 1/4W |
| R1240 | 401 023 2703 | CARBON 8.2K JA 1/4W |
| R1241 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1242 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1243 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1244 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1245 | 401 014 2804 | CARBON 150 JA 1/4W |
| R1246 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1248 | 401 013 6308 | CARBON 12K JA 1/4W |
| R1250 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1251 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1252 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1253 | 401 023 4509 | CARBON 820K JA 1/4W |
| R1254 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1255 | 401 018 2800 | CARBON 330 JA 1/4W |
| R1338 | 401 018 4903 | CARBON 33K JA 1/4W |
| | | **(SEMI VARIABLE RESISTORS)** |
| SVR1001 | 4-222V-69102 | 500 OHM |
| SVR1002 | 4-222V-69108 | 20K OHM |
| or | 4-222V-68914 | 22K OHM |
| SVR1003 | 4-222V-69107 | 10K OHM |
| or | 4-222V-68912 | 10K OHM |
| SVR1004 | 4-222V-69107 | 10K OHM |
| or | 4-222V-68912 | 10K OHM |
| SVR1005 | 4-222V-69108 | 20K OHM |
| or | 4-222V-68914 | 22K OHM |
| SVR1006 | 4-222V-69108 | 20K OHM |
| or | 4-222V-68914 | 22K OHM |
| SVR1007 | 4-222V-69108 | 20K OHM |
| or | 4-222V-68914 | 22K OHM |
| SVR1121 | 4-222V-68910 | 4.7K OHM |
| or | 4-222V-69106 | 5K OHM |
| SVR1201 | 4-222V-69111 | 100K OHM |
| or | 4-222V-68918 | 100K OHM |
| SVR1202 | 4-222V-69104 | 2K OHM |
| or | 4-222V-68908 | 2.2K OHM |
| | | **(MISCELLANEOUS)** |
| DL1201 | 4-284V-19400 | DELAY LINE |
| F1101 | 4-953V-30100 | FILTER |
| F1201 | 4-228V-21100 | LC PACK |
| HIC1001 | 143-0-208V-02750 | HIC BOARD ASSEMBLY |
| X1201 | 4-225V-18400 | CRYSTAL 4.433619MHZ |
| or | 4-225V-19000 | CRYSTAL 4.433619MHZ |

## VD-1 BOARD (AUDIO)
## NO. 143-0-233V-51222

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C2001 | 403 043 9106 | ELECT 47MF M 16V |
| C2002 | 403 043 9106 | ELECT 47MF M 16V |
| C2003 | 403 049 0008 | ELECT 1MF M 50V |
| C2004 | 403 075 4506 | CERAMIC 820PF K 50V |
| C2005 | 403 003 0600 | CERAMIC 0.018MF K 25V |
| C2006 | 403 048 6308 | ELECT 0.47MF M 50V |
| C2007 | 403 001 7007 | CERAMIC 3900PF K 16V |
| C2008 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2009 | 403 041 2109 | ELECT 47MF M 10V |
| C2010 | 403 041 8804 | ELECT 10MF M 16V |
| C2011 | 403 041 2109 | ELECT 47MF M 10V |
| C2012 | 403 049 0008 | ELECT 1MF M 50V |
| C2013 | 403 003 0600 | CERAMIC 0.018MF K 25V |
| C2014 | 403 049 0008 | ELECT 1MF M 50V |
| C2015 | 403 046 9905 | ELECT 4.7MF M 25V |
| C2016 | 403 041 8804 | ELECT 10MF M 16V |
| C2020 | 403 042 2405 | ELECT 100MF M 16V |
| C2021 | 403 003 4806 | CERAMIC 0.027MF K 25V |
| C2022 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C2023 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2024 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2025 | 403 071 6207 | CERAMIC 220PF K 50V |
| C2026 | 403 081 5207 | POLYPRO 0.027MF J 100V |
| C2071 | 403 040 1707 | ELECT 22MF M 10V |
| C2072 | 403 049 0008 | ELECT 1MF M 50V |
| C2073 | 403 039 2104 | ELECT 47MF M 6.3V |
| | | **(DIODES)** |
| D2001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2071 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2072 | 407 050 4802 | ZENER DIODE GZA5.1Y |
| D2073 | 407 050 4802 | ZENER DIODE GZA5.1Y |
| D2075 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2076 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| | | **(INTETGRATED CIRCUIT)** |
| IC2001 | 409 018 9706 | IC LA7096 |
| | | **(COILS)** |
| L2001 | 4-253V-95801 | HF CHOKE 27MH |
| L2002 | 4-253V-76249 | HF CHOKE 10MH |
| L2003 | 4-253V-76233 | HF CHOKE 560UH |

| Location | Part No. | Description |
|---|---|---|
| L2071 | 4−253V−74308 | HF CHOKE 1UH |
| | | **(TRANSISTORS)** |
| Q2001 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP-AA |
| Q2002 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP-AA |
| Q2071 | 405 009 7003 | TR 2SB985 T |
| Q2072 | 405 006 6702 | TR 2SA984-F |
| Q2073 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP-AA |
| Q2074 | 405 023 5009 | TR 2SD400-E-MP |
| or | 405 023 5306 | TR 2SD400-F-MP |
| Q2075 | 405 006 6702 | TR 2SA984-F |
| Q2076 | 405 006 6702 | TR 2SA984-F |
| or | 405 006 6504 | TR 2SA984-E |
| Q2077 | 405 006 6702 | TR 2SA984-F |
| or | 405 006 6504 | TR 2SA984-E |
| Q2078 | 405 019 1909 | TR 2SC536-E-NP |
| or | 405 019 2708 | TR 2SC536-F-NP-AA |
| | | **(RESISTORS)** |
| R2001 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R2002 | 401 012 4404 | CARBON 100 JA 1/4W |
| R2003 | 401 016 5704 | CARBON 220K JA 1/4W |
| R2004 | 401 021 8905 | CARBON 6.2K JA 1/4W |
| R2005 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2006 | 401 016 4707 | CARBON 22K JA 1/4W |
| R2007 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R2008 | 401 022 7105 | CARBON 750 JA 1/4W |
| R2009 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R2010 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R2011 | 401 023 1607 | CARBON 820 JA 1/4W |
| R2012 | 401 016 6404 | CARBON 2.2M JA 1/4W |
| R2013 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2014 | 401 023 1607 | CARBON 820 JA 1/4W |
| R2015 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2016 | 401 105 3701 | CARBON 18K JA 1/4W |
| R2017 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2018 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2020 | 401 012 4404 | CARBON 100 JA 1/4W |
| R2021 | 401 019 2908 | CARBON 39K JA 1/4W |
| R2025 | 401 017 7509 | CARBON 3.9 JA 1/4W |
| R2026 | 401 018 4804 | CARBON 33K JA 1/4W |
| R2027 | 401 018 4804 | CARBON 33K JA 1/4W |
| R2071 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R2072 | 401 021 1807 | CARBON 560 JA 1/4W |
| R2073 | 401 016 2505 | CARBON 220 JA 1/4W |
| R2074 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R2075 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2076 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2077 | 401 018 7508 | CARBON 360 JA 1/4W |
| R2078 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2079 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2080 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2081 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2083 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2084 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2086 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2087 | 401 022 4005 | CARBON 68K JA 1/4W |
| R2088 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2089 | 401 016 4707 | CARBON 22K JA 1/4W |
| R2091 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2092 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2093 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2094 | 401 015 0502 | CARBON 18 JA 1/4W |
| | | **(SEMI VARIABLE RESISTORS)** |
| SVR2001 | 4−222V−68918 | 100K OHM |
| or | 4−222V−69011 | 100K OHM |
| or | 4−222V−69111 | 100K OHM |
| SVR2002 | 4−222V−68912 | 10K OHM |
| or | 4−222V−69007 | 10K OHM |
| or | 4−222V−69107 | 10K OHM |

| Location | Part No. | Description |
|---|---|---|
| | | **(TRANSFORMER)** |
| T2001 | 4−258V−18600 | OSC COIL |
| | | **(MISCELLANEOUS)** |
| F2071 | 4−234V−18309 | FUSE |

## VD-1 BORAD (TUNER)
**NO. 143-0-233v-51222**

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C6081 | 403 047 8402 | ELECT 0.1MF M 50V |
| C6084 | 403 048 6308 | ELECT 0.47MF M 50V |
| C6085 | 403 038 1603 | ELECT 100MF M 6.3V |
| C6086 | 403 067 7300 | MT-COMPO 0.33MF J 50V |
| or | 403 115 1007 | MT-POLYEST 0.33MF J 63V |
| C6087 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| | | **(DIODES)** |
| D6082 | 407 051 6706 | ZENER DIODE GZS5.1Y |
| or | 407 051 6805 | ZENER DIODE GZS5.1Z-BT |
| or | 407 053 6308 | ZENER DIODE MTZ5.1B-T-77 |
| or | 407 053 6407 | ZENER DIODE MTZ5.1C |
| D6083 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| | | **(COIL)** |
| L6084 | 4−253V−74308 | HF CHOKE 1UH |
| | | **(RESISTORS)** |
| R6080 | 401 012 5609 | CARBON 1K JA 1/4W |
| R6084 | 401 017 8506 | CARBON 300 JA 1/4W |
| R6085 | 401 020 0702 | CARBON 470 JA 1/4W |
| R6087 | 401 012 8006 | CARBON 100K JA 1/4W |

## HIC BOARD (VIDEO)
**NO. 143-0-208V-02750**

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C1901 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1902 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1903 | 403 068 0409 | CERAMIC 0.1MF Z 25V |
| C1904 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1905 | 403 135 0707 | CERAMIC 1MF K 25V |
| C1906 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1907 | 403 135 0707 | CERAMIC 1MF K 25V |
| C1908 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| | | **(DIODES)** |
| D1901 | 407 003 3609 | DIODE DAN202K-T-96 |
| D1902 | 407 003 4507 | DIODE DAP202K-T-96 |
| D1903 | 407 003 4507 | DIODE DAP202K-T-96 |
| | | **(TRANSISTORS)** |
| Q1901 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1902 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1903 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1904 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1905 | 405 002 0308 | TR 2SA1037K-T96-R |
| or | 405 003 1809 | TR 2SA1252-D4-TB |
| Q1906 | 405 002 0308 | TR 2SA1037K-T96-R |
| or | 405 003 1809 | TR 2SA1252-D4-TB |
| Q1907 | 405 014 4509 | TR 2SC2412K-T96-R |

| Location | Part No. | Description |
|---|---|---|
| Q1908 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1909 | 405 014 4509 | TR 2SC2412K-T96-R |
| | | **(RESISTORS)** |
| R1901 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1902 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1903 | 401 037 8609 | MT-GLAZE 1.6K JA 1/10W |
| R1904 | 401 037 9309 | MT-GLAZE 18K JA 1/10W |
| R1905 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R1906 | 401 037 8005 | MT-GLAZE 15K JA 1/10W |
| R1907 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1908 | 401 038 3603 | MT-GLAZE 3.3K JA 1/10W |
| R1909 | 401 037 6704 | MT-GLAZE 1.2K JA 1/10W |
| R1910 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1911 | 401 038 3603 | MT-GLAZE 3.3K JA 1/10W |
| R1912 | 401 037 9309 | MT-GLAZE 18K JA 1/10W |
| R1913 | 401 038 9704 | MT-GLAZE 7.5K JA 1/10W |
| R1914 | 401 037 6704 | MT-GLAZE 1.2K JA 1/10W |
| R1915 | 401 037 5400 | MT-GLAZE 1K JA 1/10W |
| R1916 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1917 | 401 037 5707 | MT-GLAZE 100K JA 1/10W |
| R1918 | 401 038 6604 | MT-GLAZE 470K JA 1/10W |
| R1919 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R1920 | 401 037 6803 | MT-GLAZE 12K JA 1/10W |
| R1921 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R1922 | 401 038 0800 | MT-GLAZE 22K JA 1/10W |
| R1923 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1924 | 401 039 0403 | MT-GLAZE 8.2K JA 1/10W |
| R1925 | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W |

## VP-1 BOARD (VIDEO PRE-AMP.)
## NO. 143-0-233V-47500

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C1601 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1602 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1603 | 403 014 3409 | CERAMIC 18PF J 50V |
| C1604 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1605 | 403 014 3409 | CERAMIC 18PF J 50V |
| C1606 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1607 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1608 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1609 | 403 039 3101 | ELECT 47MF M 6.3V |
| C1610 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1611 | 403 018 7502 | CERAMIC 220PF J 50V |
| C1612 | 403 014 3409 | CERAMIC 18PF J 50V |
| C1614 | 403 102 8705 | CERAMIC 10PF J 50V |
| C1615 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1616 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1617 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1618 | 403 043 9700 | ELECT 47MF M 16V |
| C1619 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1620 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1622 | 403 010 1102 | CERAMIC 1000PF J 50V |
| | | **(INTETGRATED CIRCUIT)** |
| IC1601 | 409 117 9706 | IC AN3331K |
| | | **(COILS)** |
| L1601 | 4–253V–76132 | HF CHOKE 100UH |
| L1602 | 4–253V–74316 | HF CHOKE 4.7UH |
| L1603 | 4–253V–74423 | HF CHOKE 18UH |
| L1604 | 4–253V–74324 | HF CHOKE 22UH |
| L1605 | 4–253V–76132 | HF CHOKE 100UH |
| | | **(TRANSISTORS)** |
| Q1601 | 405 015 9701 | TR 2SC2814-F4-TB |
| Q1602 | 405 015 9701 | TR 2SC2814-F4-TB |

| Location | Part No. | Description |
|---|---|---|
| | | **(RESISTORS)** |
| R1601 | 401 038 5508 | MT-GLAZE 4.7 JA 1/10W |
| R1602 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1603 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1604 | 401 038 9001 | MT-GLAZE 680 JA 1/10W |
| R1605 | 401 037 7909 | MT-GLAZE 1.5K JA 1/10W |
| R1606 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R1607 | 401 039 0304 | MT-GLAZE 820 JA 1/10W |
| R1608 | 401 037 6704 | MT-GLAZE 1.2K JA 1/10W |
| R1609 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1610 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1611 | 401 035 4900 | MT-GLAZE 1K JA 1/8W |
| R1613 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1651 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1652 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1653 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1654 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1655 | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W |

## SY-1 BOARD (SYSTEM CONTROL)
## NO. 143-0-233V-46700

| Location | Part No. | Description |
|---|---|---|
| | | **(COMPOSITE)** |
| B3001 | 405 018 2501 | TR 2SC3399 |
| B3002 | 405 018 2501 | TR 2SC3399 |
| | | **(CAPACITORS)** |
| C3001 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3002 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3003 | 403 048 6308 | ELECT 0.47MF M 50V |
| C3004 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3006 | 403 038 1603 | ELECT 100MF M 6.3V |
| C3007 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3008 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3009 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3010 | 403 069 0705 | CERAMIC 1000PF K 50V |
| C3011 | 403 049 9803 | ELECT 2.2MF M 50V |
| C3012 | 403 085 7405 | NP-ELECT 10MF M 25V |
| C3013 | 403 002 2506 | CERAMIC 0.01MF M 25V |
| C3014 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3015 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3016 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3017 | 403 046 9905 | ELECT 4.7MF M 25V |
| C3018 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3019 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3020 | 403 022 0902 | CERAMIC 30PF J 50V |
| C3021 | 403 022 0902 | CERAMIC 30PF J 50V |
| C3022 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3023 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3024 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3025 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3026 | 403 038 1603 | ELECT 100MF M 6.3V |
| C3027 | 403 069 0705 | CERAMIC 1000PF K 50V |
| C3028 | 403 071 6207 | CERAMIC 220PF K 50V |
| C3029 | 403 071 6207 | CERAMIC 220PF K 50V |
| | | **(DIODES)** |
| D3002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D3003 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D3011 | 407 050 3805 | ZENER DIODE GZA4.7Z |
| or | 407 059 0706 | ZENER DIODE 05Z4.7Z |
| D3012 | 407 050 6202 | ZENER DIODE GZA6.2Y |
| or | 407 059 1802 | ZENER DIODE 05Z6.2Y |
| D3013 | 407 050 7902 | ZENER DIODE GZA9.1Z |

| Location | Part No. | Description |
|---|---|---|
| | | **(INTETGRATED CIRCUITS)** |
| IC3001 | 410 030 7304 | IC HD404418SM10 |
| or | 410 030 7403 | IC HD4074418S10 |
| IC3002 | 410 028 3301 | IC TMS70C20-28C71022 |
| IC3003 | 409 114 4803 | IC LB1641 |
| or | 409 111 9405 | IC BA6209N |
| IC3004 | 409 018 3902 | IC LA6393D |
| or | 409 057 3406 | IC UPC393C |
| | | **(TRANSISTORS)** |
| Q3001 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3002 | 405 019 2807 | TR 2SC536-F-SPA |
| Q3003 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3004 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3005 | 405 006 6504 | TR 2SA984-E |
| | | **(RESISTORS)** |
| R3001 | 401 012 9201 | CARBON 1M JA 1/4W |
| R3002 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3003 | 401 012 4404 | CARBON 100 JA 1/4W |
| R3004 | 401 018 5702 | CARBON 330K JA 1/4W |
| R3005 | 401 014 6000 | CARBON 150K JA 1/4W |
| R3006 | 401 022 7105 | CARBON 750 JA 1/4W |
| R3007 | 401 019 8603 | CARBON 430K JA 1/4W |
| R3008 | 401 019 2908 | CARBON 39K JA 1/4W |
| R3009 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3010 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3011 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3012 | 401 020 2805 | CARBON 47K JA 1/4W |
| R3013 | 401 017 2702 | CARBON 27K JA 1/4W |
| R3014 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3015 | 401 022 4005 | CARBON 68K JA 1/4W |
| R3016 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R3017 | 401 020 2805 | CARBON 47K JA 1/4W |
| R3018 | 401 017 2702 | CARBON 27K JA 1/4W |
| R3019 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3020 | 401 022 4005 | CARBON 68K JA 1/4W |
| R3021 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R3022 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3023 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3024 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3025 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3026 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3027 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3028 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3029 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R3030 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3031 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3032 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3033 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3034 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3035 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3036 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3037 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3038 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3039 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3040 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3041 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3043 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3044 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3045 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3046 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3047 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3048 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3049 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3050 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3051 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3052 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3053 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3054 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3055 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3056 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3057 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3059 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3060 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3061 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3062 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3063 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3064 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3066 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3068 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3070 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3071 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3072 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3073 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3074 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3075 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3076 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3077 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3078 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3079 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3080 | 401 020 2904 | CARBON 47K JA 1/4W |
| R3081 | 401 018 4903 | CARBON 33K JA 1/4W |
| R3082 | 401 012 8006 | CARBON 100K JA 1/4W |
| R3083 | 401 017 9701 | CARBON 30K JA 1/4W |
| R3084 | 401 017 9701 | CARBON 30K JA 1/4W |
| R3085 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R3086 | 401 013 7206 | CARBON 120K JA 1/4W |
| R3087 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3088 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R3089 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3090 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3091 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3092 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3093 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3094 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3095 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3104 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R3105 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3107 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3108 | 401 019 1802 | CARBON 3.9K JA 1/4W |
| R3111 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3112 | 401 012 9201 | CARBON 1M JA 1/4W |
| R3114 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3115 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3151 | 402 034 7602 | FUSIBLE RES 3.3 JA 1/2W |
| | | **(MISCELLANEOUS)** |
| X3001 | 4−266V−02900 | RESONATOR 8MHZ |
| or | 4−266V−03200 | RESONATOR 8MHZ |
| X3002 | 4−266V−02800 | RESONATOR 5MHZ |
| or | 4−266V−03100 | RESONATOR 5MHZ |

## SY-1 BOARD (SERVO)
## NO. 143-0-233V-46700

| Location | Part No. | Description |
|---|---|---|
| | | **(COMPOSITE)** |
| B4001 | 405 018 2501 | TR 2SC3399 |
| or | 405 000 6104 | TR DTC144ES |
| B4002 | 405 018 2501 | TR 2SC3399 |
| or | 405 000 6104 | TR DTC144ES |
| B4003 | 405 018 2501 | TR 2SC3399 |
| or | 405 000 6104 | TR DTC144ES |
| | | **(CAPACITORS)** |
| C4001 | 403 115 1601 | CERAMIC 5600PF K 16V |
| C4002 | 403 115 1601 | CERAMIC 5600PF K 16V |
| C4003 | 403 041 9405 | ELECT 10MF M 16V |
| C4004 | 403 063 1302 | POLYESTER 0.068MF J 50V |

| Location | Part No. | Description |
|---|---|---|
| C4005 | 403 039 2104 | ELECT 47MF M 6.3V |
| C4006 | 403 004 1002 | CERAMIC 0.047MF M 25V |
| C4007 | 403 044 7002 | ELECT 10MF M 25V |
| or | 403 091 0803 | TA-SOLID 10MF K 16V |
| C4008 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4009 | 403 001 8806 | CERAMIC 6800PF K 16V |
| C4010 | 403 001 8806 | CERAMIC 6800PF K 16V |
| C4011 | 403 059 6007 | POLYESTER 0.022MF K 50V |
| C4012 | 403 059 6007 | POLYESTER 0.022MF K 50V |
| C4013 | 403 061 8501 | POLYESTER 4700PF K 50V |
| C4014 | 403 071 6207 | CERAMIC 220PF K 50V |
| C4016 | 403 049 0008 | ELECT 1MF M 50V |
| C4017 | 403 049 0008 | ELECT 1MF M 50V |
| C4018 | 403 068 9402 | CERAMIC 100PF K 50V |
| C4019 | 403 043 4507 | ELECT 33MF M 16V |
| C4020 | 403 039 2104 | ELECT 47MF M 6.3V |
| C4021 | 403 004 1002 | CERAMIC 0.047MF M 25V |
| C4022 | 403 001 3207 | CERAMIC 1200PF K 16V |
| C4023 | 403 049 0008 | ELECT 1MF M 50V |
| C4024 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C4025 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C4026 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C4027 | 403 065 8101 | MT-POLYEST 0.22MF J 63V |
| or | 403 067 6709 | MT-COMPO 0.22MF J 50V |
| C4029 | 403 004 0500 | CERAMIC 0.047MF K 25V |
| C4030 | 403 003 6701 | CERAMIC 0.033MF K 25V |
| C4031 | 403 085 4008 | NP-ELECT 10MF M 16V |
| C4032 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C4033 | 403 039 2609 | ELECT 47MF M 6.3V |
| C4034 | 403 001 5003 | CERAMIC 2200PF K 16V |
| C4035 | 403 041 9405 | ELECT 10MF M 16V |
| C4036 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4037 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4038 | 403 044 7002 | ELECT 10MF M 25V |
| or | 403 091 0803 | TA-SOLID 10MF K 16V |
| C4039 | 403 046 1602 | ELECT 3.3MF M 25V |
| C4040 | 403 059 6502 | POLYESTER 0.022MF K 50V |
| C4041 | 403 048 2706 | ELECT 0.22MF M 50V |
| C4042 | 403 039 2708 | ELECT 47MF M 6.3V |
| C4043 | 403 003 3700 | CERAMIC 0.022MF Z 25V |
| C4044 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4045 | 403 003 2802 | CERAMIC 0.022MF K 25V |
| C4047 | 403 049 9803 | ELECT 2.2MF M 50V |
| C4049 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C4051 | 403 041 9405 | ELECT 10MF M 16V |
| C4052 | 403 003 3700 | CERAMIC 0.022MF Z 25V |
| | | **(DIODES)** |
| D4001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4003 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4004 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4005 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4006 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4007 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4008 | 407 013 7109 | DIODE 1S2473 |
| D4009 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4010 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4011 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4012 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4013 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |

| Location | Part No. | Description |
|---|---|---|
| D4014 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| | | **(INTETGRATED CIRCUITS)** |
| IC4001 | 409 114 3004 | IC LC7412-8017 |
| IC4002 | 409 114 4100 | IC LA7116 |
| IC4003 | 409 051 3006 | IC TC4053BP |
| IC4004 | 409 003 6109 | IC BA728 |
| | | **(TRANSISTORS)** |
| Q4001 | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| Q4002 | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| Q4003 | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| Q4006 | 405 038 0501 | TR 2SK404-E-AC |
| Q4007 | 405 006 1806 | TR 2SA933S-R |
| Q4008 | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| | | **(RESISTORS)** |
| R4001 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4002 | 401 012 7009 | CARBON 10K JA 1/4W |
| R4004 | 401 020 2805 | CARBON 47K JA 1/4W |
| R4005 | 401 020 2805 | CARBON 47K JA 1/4W |
| R4006 | 401 018 5702 | CARBON 330K JA 1/4W |
| R4007 | 401 014 6000 | CARBON 150K JA 1/4W |
| R4008 | 401 022 4005 | CARBON 68K JA 1/4W |
| R4009 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4010 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4011 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4012 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4013 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4014 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4015 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4016 | 401 012 4404 | CARBON 100 JA 1/4W |
| R4017 | 401 014 6000 | CARBON 150K JA 1/4W |
| R4018 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4019 | 401 022 5101 | CARBON 680K JA 1/4W |
| R4020 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4021 | 401 012 8105 | CARBON 100K JA 1/4W |
| R4022 | 401 017 2702 | CARBON 27K JA 1/4W |
| R4023 | 401 017 2702 | CARBON 27K JA 1/4W |
| R4024 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4025 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4028 | 401 012 4404 | CARBON 100 JA 1/4W |
| R4029 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4030 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4031 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R4032 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4033 | 401 021 4907 | CARBON 560K JA 1/4W |
| R4034 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R4035 | 401 018 5702 | CARBON 330K JA 1/4W |
| R4036 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4037 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4039 | 401 012 9201 | CARBON 1M JA 1/4W |
| R4040 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4041 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4042 | 401 087 4101 | MT-FILM 4.7K FD 1/6W |
| R4043 | 401 087 4101 | MT-FILM 4.7K FD 1/6W |
| R4044 | 401 015 4609 | CARBON 180K JA 1/4W |
| R4045 | 401 020 3802 | CARBON 470K JA 1/4W |
| R4046 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4047 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4048 | 401 016 5704 | CARBON 220K JA 1/4W |
| R4049 | 401 018 2701 | CARBON 330 JA 1/4W |
| R4050 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4053 | 401 019 2908 | CARBON 39K JA 1/4W |
| R4054 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4055 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4056 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4057 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4058 | 401 012 6903 | CARBON 10K JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R4060 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4061 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4063 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4064 | 401 017 3709 | CARBON 270K JA 1/4W |
| R4065 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4066 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4067 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4068 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4069 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4072 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4073 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4074 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4075 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4076 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4077 | 401 012 4404 | CARBON 100 JA 1/4W |
| R4078 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4079 | 401 014 5102 | CARBON 15K JA 1/4W |
| R4080 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4081 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4082 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4083 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4084 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4085 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4086 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4088 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4089 | 401 016 4806 | CARBON 22K JA 1/4W |
| R4090 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4091 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4092 | 401 012 9201 | CARBON 1M JA 1/4W |
|  |  | **(SEMI VARIABLE RESISTORS)** |
| SVR4001 | 4–222V–69112 | 200K OHM |
| or | 4–222V–68920 | 220K OHM |
| SVR4002 | 4–222V–69112 | 200K OHM |
| or | 4–222V–68920 | 220K OHM |
| SVR4003 | 4–222V–69112 | 200K OHM |
| or | 4–222V–68920 | 220K OHM |
| SVR4004 | 4–222V–29600 | 100K OHM |

## PW-1 BOARD (POWER SUPPLY)
## NO. 143-0-233V-43575

| Location | Part No. | Description |
|---|---|---|
|  | 143–2–383T–03100 | FUSE HOLDER |
|  | 143–2–368T–11300 | HEAT SINK |
|  |  | **(CAPACITORS)** |
| C5001 | 403 050 5504 | ELECT 2200MF M 50V |
| C5002 | 403 054 6002 | ELECT 100MF M 100V |
| C5003 | 403 054 9409 | ELECT 47MF M 100V |
| C5004 | 403 049 0008 | ELECT 1MF M 50V |
| C5005 | 403 039 6508 | ELECT 100MF M 10V |
| C5006 | 403 039 6508 | ELECT 100MF M 10V |
| C5007 | 403 049 0008 | ELECT 1MF M 50V |
| C5008 | 403 043 1902 | ELECT 2200MF M 16V |
| C5009 | 403 043 9106 | ELECT 47MF M 16V |
| C5011 | 403 049 0008 | ELECT 1MF M 50V |
| C5012 | 403 049 4204 | ELECT 10MF M 50V |
| C5014 | 403 057 2902 | POLYESTER 0.1MF K 50V |
| or | 403 057 3503 | POLYESTER 0.1MF K 50V |
| C5101 | ⚠404 031 1201 | MT-COMPO 4700PF M 250V |
|  |  | **(DIODES)** |
| D5001 | ⚠407 081 2402 | DIODE DSA12TC-KC6 |
| D5002 | ⚠407 081 2402 | DIODE DSA12TC-KC6 |
| D5003 | ⚠407 081 2402 | DIODE DSA12TC-KC6 |
| D5004 | ⚠407 081 2402 | DIODE DSA12TC-KC6 |
| D5005 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5006 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5007 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5009 | 407 050 9104 | ZENER DIODE GZB16C |
| D5010 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |
| ~~D5011~~ | ~~407 065 7904~~ | ~~ZENER DIODE GZS12X~~ 63-0810 |
| ~~or~~ | ~~407 053 3109~~ | ~~ZENER DIODE MTZ12A~~ |
| D5012 | 407 051 6003 | ZENER DIODE GZS33X |
| or | 407 078 1104 | ZENER DIODE MTZ33A-T-77 |
| D5013 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |
| D5014 | 407 051 6706 | ZENER DIODE GZS5.1Y |
| or | 407 053 6407 | ZENER DIODE MTZ5.1C |
| D5015 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |
|  |  | **(INTETGRATED CIRCUIT)** |
| IC5001 | ⚠409 114 5206 | IC STK7226 |
|  |  | **(COILS)** |
| L5001 | 4–252V–12100 | LF CHOKE 200UH |
| or | 4–252V–12200 | LF CHOKE 200UH |
| or | 4–252V–13500 | LF CHOKE 200UH |
| L5002 | ⚠ 4–471V–10200 | CORE |
| L5003 | ⚠ 4–471V–10200 | CORE |
| L5101 | ⚠ 4–953V–26200 | FILTER |
|  |  | **(TRANSISTORS)** |
| Q5002 | 405 006 7204 | TR 2SA984K-F 63-1416 |
| ~~or~~ | ~~405 006 7006~~ | ~~TR 2SA984K-E~~ |
| Q5003 | 405 007 5308 | TR 2SB560-F-MP |
| or | 405 007 5100 | TR 2SB560-E-MP |
| Q5004 | 405 043 6000 | TR 2SC3807 |
| Q5005 | 405 019 2708 | TR 2SC536-F-NP-AA |
| or | 405 019 1909 | TR 2SC536-E-NP |
|  |  | **(RESISTORS)** |
| R5001 | ⚠402 034 6100 | FUSIBLE RES 2.7 JA 1/2W |
| ~~R5002~~ | ~~401 016 7906~~ | ~~CARBON 2.4K JA 1/4W~~ |
| ~~R5003~~ | ~~401 016 7906~~ | ~~CARBON 2.4K JA 1/4W~~ |
| ~~R5004~~ | ~~401 016 7906~~ | ~~CARBON 2.4K JA 1/4W~~ |
| R5005 | 401 014 5102 | CARBON 15K JA 1/4W |
| R5006 | 401 019 7705 | CARBON 4.3K JA 1/4W |
| R5007 | 401 019 7705 | CARBON 4.3K JA 1/4W |
| R5008 | ⚠402 023 2106 | FUSIBLE RES 47 JA 1/4W |
| R5009 | 401 018 8307 | CARBON 36K JA 1/4W |
| R5010 | 401 014 2804 | CARBON 150 JA 1/4W |
| R5011 | 401 014 2804 | CARBON 150 JA 1/4W |
| R5012 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5013 | 401 018 7904 | CARBON 3.6K JA 1/4W |
| R5014 | 401 014 8509 | CARBON 1.6K JA 1/4W |
| R5015 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R5016 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5017 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5018 | 401 023 2703 | CARBON 8.2K JA 1/4W |
|  |  | **(MISCELLANEOUS)** |
| F5001 | ⚠ 4–234V–18313 | FUSE 0.8A |
| F5101 | ⚠ 4–234V–17606 | FUSE 0.4A |

## TN-1 BOARD (TUNER IF)
## NO. 143-0-233V-41000

| Location | Part No. | Description |
|---|---|---|
|  |  | **(CAPACITORS)** |
| C6009 | 403 049 1005 | ELECT 1MF M 50V |
| C6012 | 403 053 9707 | ELECT 4.7MF M 35V |

| Location | Part No. | Description |
|---|---|---|
| C6014 | 403 047 9201 | ELECT 0.1MF M 50V |
| C6016 | 403 043 9700 | ELECT 47MF M 16V |
| C6024 | 403 041 9603 | ELECT 10MF M 16V |
| C6025 | 403 041 9603 | ELECT 10MF M 16V |
| C6026 | 403 058 2406 | POLYESTER 0.015MF J 50V |
| | | **(DIODE)** |
| D6001 | 407 012 4406 | DIODE 1SS133 |
| | | **(INTETGRATED CIRCUIT)** |
| IC6001 | 409 019 3307 | IC LA7530N |
| | | **(COILS)** |
| L6002 | 4-253V-78700 | HF CHOKE 1.2UH |
| L6003 | 4-253V-74421 | HF CHOKE 12UH |
| L6004 | 4-253V-74426 | HF CHOKE 33UH |
| | | **(TRANSISTOR)** |
| Q6004 | 405 011 8302 | TR 2SC1740S-E |
| | | **(RESISTOR)** |
| R6022 | 402 004 1203 | FUSIBLE RES 22 JA 1/4W |
| | | **(TRANSFORMER)** |
| T6001 | 4-256V-35000 | IFT |
| T6002 | 4-256V-35100 | IFT |
| T6003 | 4-256V-35200 | IFT |
| | | **(VARIABLE RESISTOR)** |
| VR6001 | 4-222V-68912 | 10K OHM |
| | | **(MISCELLANEOUS)** |
| F6002 | 4-953V-23700 | FILTER |
| F6003 | 4-953V-32300 | FILTER |
| F6004 | 4-953V-00400 | FILTER |

## TN-2 BOARD (TUNING CONTROL)

**NO. 143-0-233V-49127**

83-0417

| Location | Part No. | Description |
|---|---|---|
| | | **(COMPOSITE)** |
| B6101 | 405 018 1900 | TR 2SC3395-TB |
| B6102 | 405 018 1900 | TR 2SC3395-TB |
| | | **(CAPACITORS)** |
| C6101 | 403 050 3302 | ELECT 22MF M 50V |
| C6102 | 403 048 2508 | ELECT 0.22MF M 50V |
| C6103 | 403 049 4808 | ELECT 10MF M 50V |
| C6104 | 403 038 6806 | ELECT 220MF M 6.3V |
| C6105 | 403 050 7102 | ELECT 3.3MF M 50V |
| C6106 | 403 041 9405 | ELECT 10MF M 16V |
| C6107 | 403 048 4809 | ELECT 0.33MF M 50V |
| C6109 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6110 | 403 022 8205 | CERAMIC 33PF J 50V |
| C6111 | 403 022 8205 | CERAMIC 33PF J 50V |
| C6112 | 403 020 0508 | CERAMIC 27PF J 50V |
| C6113 | 403 015 1008 | CERAMIC 180PF K 50V |
| C6114 | 403 015 1008 | CERAMIC 180PF K 50V |
| C6115 | 403 067 5603 | MT-COMPO 0.1MF J 50V |
| C6116 | 403 067 7300 | MT-COMPO 0.33MF J 50V |
| C6117 | 403 009 9409 | CERAMIC 100PF K 50V |
| C6118 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6119 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6120 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6121 | 403 071 8102 | CERAMIC 2200PF K 50V |
| C6122 | 403 048 4809 | ELECT 0.33MF M 50V |
| | | **(DIODES)** |
| D6101 | 407 004 8009 | DIODE DSB015-TB |
| D6102 | 407 004 8009 | DIODE DSB015-TB |
| D6103 | 407 004 8009 | DIODE DCB015-TB |
| D6104 | 407 004 8009 | DIODE DSB015-TB |
| | | **(INTETGRATED CIRCUITS)** |
| IC6101 | 409 119 0701 | IC M50434320SP |
| IC6102 | 409 119 0602 | IC M58655P |
| IC6103 | 409 114 4308 | IC LA7214 |
| IC6104 | 409 057 5103 | IC UPC574J |
| or | 409 026 8203 | IC L5631 |
| | | **(TRANSISTORS)** |
| Q6101 | 405 068 0007 | TR 2SA1362-GR-TE85L |
| Q6102 | 405 044 6009 | TR 2SC3361-S5-TB |
| Q6103 | 405 045 6701 | TR 2SK436-18-TB |
| Q6104 | 405 065 5708 | TR FMS1-T98 |
| Q6105 | 405 002 6508 | TR 2SA1179-M5-TB |
| Q6106 | 405 068 0007 | TR 2SA1362-GR-TE85L |
| | | **(RESISTORS)** |
| R6101 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6103 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6104 | 401 037 5400 | MT-GLAZE 1K JA 1/10W |
| R6105 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6106 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6107 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6108 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6109 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6110 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6111 | 401 038 3702 | MT-GLAZE 33K JA 1/10W |
| R6112 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6113 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R6114 | 401 038 0800 | MT-GLAZE 22K JA 1/10W |
| R6116 | 401 038 5904 | MT-GLAZE 4.3K JA 1/10W |
| R6117 | 401 037 7909 | MT-GLAZE 1.5K JA 1/10W |
| R6118 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6119 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6120 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6121 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6122 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6123 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6124 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6125 | 401 037 7909 | MT-GLAZE 1.5K JA 1/10W |
| R6126 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6127 | 401 038 3504 | MT-GLAZE 330 JA 1/10W |
| R6128 | 401 038 3801 | MT-GLAZE 330K JA 1/10W |
| R6129 | 401 038 2309 | MT-GLAZE 270K JA 1/10W |
| R6131 | 401 038 6604 | MT-GLAZE 470K JA 1/10W |
| R6132 | 401 038 3801 | MT-GLAZE 330K JA 1/10W |
| R6134 | 401 037 5806 | MT-GLAZE 1M JA 1/10W |
| R6135 | 401 038 3801 | MT-GLAZE 330K JA 1/10W |
| R6136 | 401 038 5409 | MT-GLAZE 390K JA 1/10W |
| R6137 | 401 035 4900 | MT-GLAZE 1K JA 1/8W |

## TM-4 BOARD (CHANNEL SELECT & TIMER)

**NO. 143-0-233V-49421**

| Location | Part No. | Description |
|---|---|---|
| | 143-2-386T-03900 | BRACKET,DIGITAL DISPLAY |
| | | **(COMPOSITE)** |
| B7401 | 4-956V-10304 | R-PACK 10K OHMX4 |
| B7402 | 4-956V-10304 | R-PACK 10K OHMX4 |
| | | **(CAPACITORS)** |
| C7401 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C7402 | 403 016 7603 | CERAMIC 2.7PF C 50V |
| C7403 | 403 017 9705 | CERAMIC 22PF J 50V |
| C7404 | 403 017 9705 | CERAMIC 22PF J 50V |

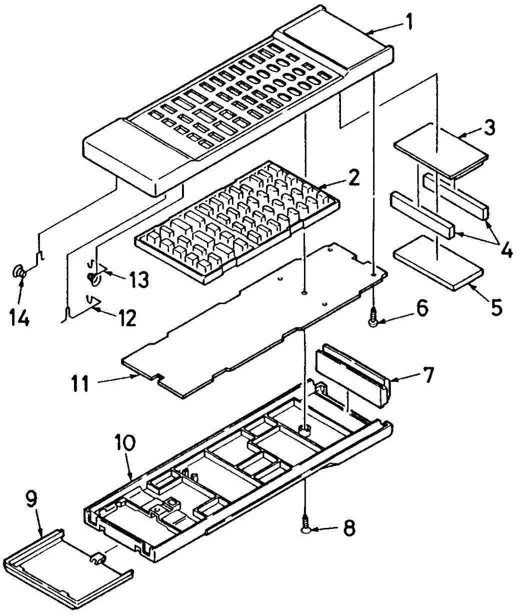
| Location | Part No. | Description |
|---|---|---|
| C7405 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C7406 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7407 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7408 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7409 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7410 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7411 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7412 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C7413 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C7414 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C7415 | 403 048 7107 | ELECT 0.47MF M 50V |
| C7416 | 403 046 4009 | ELECT 33MF M 25V |
| C7417 | 403 046 4009 | ELECT 33MF M 25V |
| C7418 | 403 049 5003 | ELECT 10MF M 50V |
| C7419 | 403 037 8504 | DL-ELECT 0.047F Z 5.5V |
| or | 403 037 8603 | DL-ELECT 0.047F Z 5.5V |
| | | **(DIODES)** |
| D7401 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7402 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7403 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7404 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7405 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7406 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7407 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7408 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7409 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7411 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7412 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7413 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7414 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7415 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7416 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7417 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7418 | 407 005 4703 | DIODE DS446 |
| D7419 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| | | **(INTETGRATED CIRCUITS)** |
| IC7401 | 409 121 3707 | IC M50955-697SP |
| IC7402 | 409 032 3308 | IC MN1280-L |
| | | **(RESISTORS)** |
| R7401 | 401 012 9201 | CARBON 1M JA 1/4W |
| R7402 | 401 012 9904 | CARBON 10M JA 1/4W |
| R7403 | 401 018 5702 | CARBON 330K JA 1/4W |
| R7404 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7405 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7406 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7407 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7408 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7409 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7410 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7411 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7412 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7413 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7414 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7415 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7416 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7417 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7418 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7419 | 401 019 2908 | CARBON 39K JA 1/4W |
| R7420 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7421 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7422 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7424 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7425 | 401 018 4804 | CARBON 33K JA 1/4W |
| R7426 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7427 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7428 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7429 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7430 | 401 012 4404 | CARBON 100 JA 1/4W |
| R7431 | 401 017 8506 | CARBON 300 JA 1/4W |
| | | **(MISCELLANEOUS)** |
| A7401 | 4–985V–06000 | DIGITAL DISPLAY |
| A7402 | 4–193V–00200 | REMOTE CONTROL RECEIVER |
| CT7401 | 4–224V–12700 | TRIMMER |
| X7401 | 4–225V–23900 | CRYSTAL 4.19MHZ |
| or | 4–225V–24100 | CRYSTAL 4.19MHZ |
| X7402 | 4–225V–23100 | CRYSTAL 32KHZ |
| or | 4–225V–24200 | CRYSTAL 32KHZ |
| or | 4–225V–26100 | CRYSTAL 32KHZ |

## TM-5 BOARD (KEY OPERATION)
**NO. 143-0-233V-49500**

| Location | Part No. | Description |
|---|---|---|
| | | **(SWITCHES)** |
| S7001 | 4–231V–72200 | PUSH SWITCH |
| or | 4–231V–73000 | PUSH SWITCH |
| S7002 | 4–231V–72200 | PUSH SWITCH |
| or | 4–231V–73000 | PUSH SWITCH |
| | | **(VARIABLE RESISTORS)** |
| VR7001 | 4–222V–33700 | 500K OHM |
| VR7002 | 4–222V–32200 | 5K OHM |

## REMOTE CONTROL UNIT
### NO. 143-9-4100-68900

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 143-0-111T-10700 | CASE, TOP |
| 2 | 143-2-161T-86500 | PUSH BUTTON |
| 3 | 4-970V-00600 | LCD |
| 4 | 4-400V-00400 | CONNECTOR |
| 5 | 143-2-352T-24500 | SPACER |
| 6 | 411 104 7008 | SCR S-TPG BIN 2X5 |
| 7 | 143-2-132T-12100 | IR WINDOW |
| 8 | 411 100 0706 | SCR S-TPG FLT 2X10 |
| 9 | 143-2-128T-03600 | LID, BATTERY |
| 10 | 143-2-125T-09800 | CASE, BOTTOM |
| 11 | 143-0-233V-58300 | RM-1 ASSY. |
| 12 | 143-2-382T-03400 | TERMINAL, INCLUDE RM-1 |
| 13 | 143-2-382T-03300 | TERMINAL, INCLUDE RM-1 |
| 14 | 143-2-382T-03200 | TERMINAL |



## RM-1 BOARD (REMOTE CONTROL)
### NO. 143-0-233V-58300

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C1 | 403 041 9405 | ELECT 10U M 16V |
| C2 | 4-224V-15600 | TRIMMER |
| C3 | 403 017 7404 | CERAMIC 22P J 50V |
| C4 | 403 009 3407 | CERAMIC 100P J 50V |
| C5 | 403 009 3407 | CERAMIC 100P J 50V |
| C6 | 403 042 3006 | ELECT 100U M 16V |
| or | 403 042 3006 | ELECT 100U M 16V |
| C7 | 403 042 3006 | ELECT 100U M 16V |
| C8 | 403 002 1903 | CERAMIC 0.01U K 25V |
| C9 | 403 002 1903 | CERAMIC 0.01U K 25V |
| C10 | 403 002 1903 | CERAMIC 0.01U K 25V |
| | | **(DIODES)** |
| D1 | 407 017 3701 | LED SE303A |
| or | 407 094 6909 | LED LN66S |
| D2 | 407 017 3701 | LED SE303A |
| or | 407 094 6909 | LED LN66S |
| D3 | 407 008 5103 | DIODE MA151K |
| | | **(INTETGRATED CIRCUIT)** |
| IC1 | 409 125 2300 | IC MN158452ESJ |
| | | **(TRANSISTOR)** |
| Q1 | 405 060 3303 | TR UN1231 |
| | | **(RESISTORS)** |
| R1 | 401 012 2202 | CARBON 1.8 JA 1/4W |
| R2 | 401 012 2202 | CARBON 1.8 JA 1/4W |
| R3 | 401 035 8205 | MT-GLAZE 150K JA 1/8W |
| R9 | 401 035 4603 | MT-GLAZE 100 JA 1/8W |
| R10 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| R11 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| R12 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| | | **(MISCELLANEOUS)** |
| X1 | 4-266V-01600 | RESONATOR |
| X2 | 4-225V-23100 | RESONATOR |

**SANYO Electric Co., Ltd.**
OSAKA, JAPAN

'87/May/2000 HA Printed in Japan

# BLOCK CIRCUIT DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED CIRCUIT BOARDS

# VHR-3300E (U.K)

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| P.C.B. SY-1 | SERVO CIRCUIT | Ⓖ |
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| P.C.B. TN-2 | TUNING CONTROL CIRCUIT & P.C.B. | |

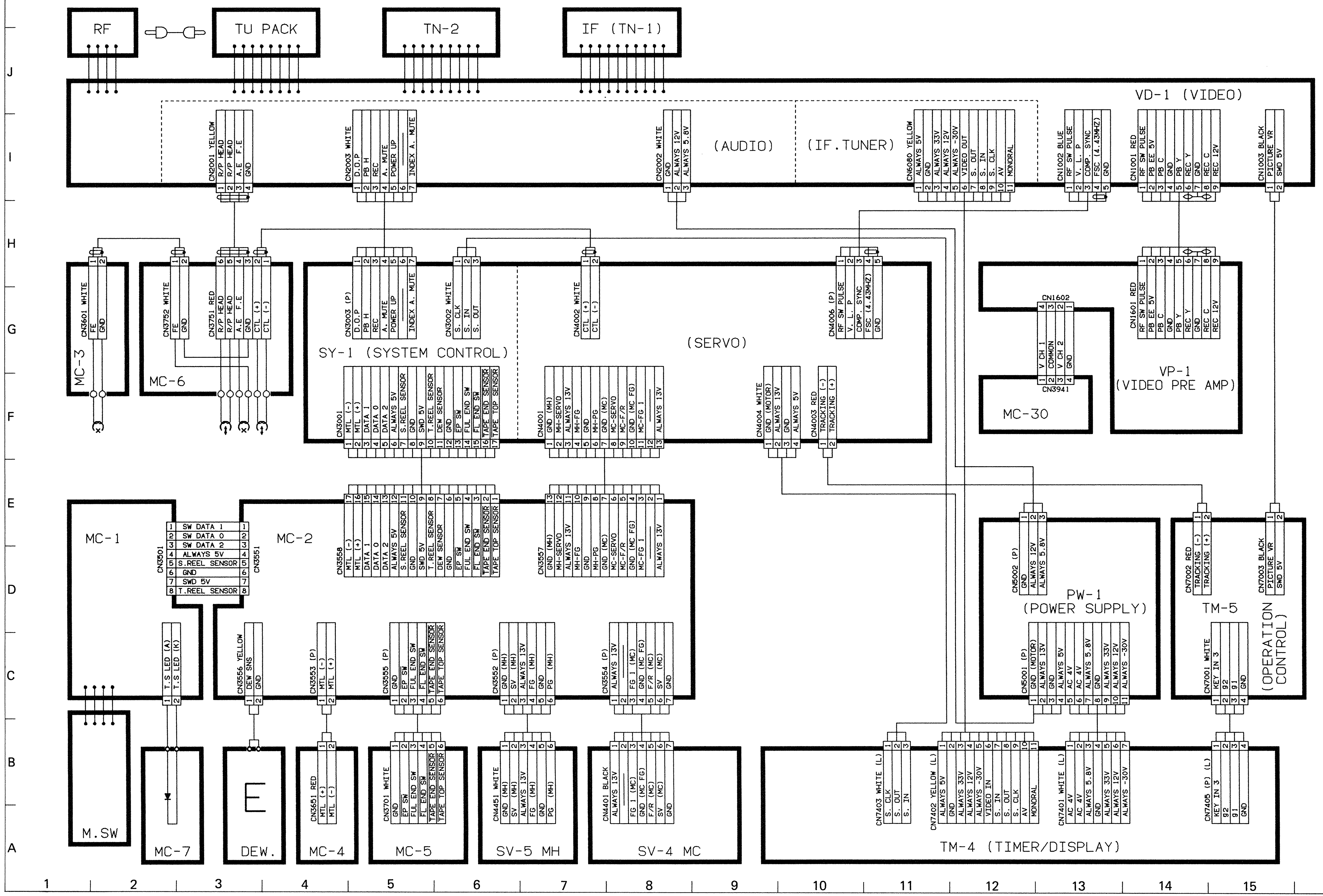
**NOTES:**

1. All resistance values in "OHMS" unless otherwise noted. (K=1,000 M=1,000,000)
2. All capacitance values in "μfd" unless otherwise noted. p=pico farad
3. All inductance values in "mH" unless otherwise noted. μ=micro henry

## PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL ( ⚠ ) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SIMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

## OVERALL WIRING DIAGRAM


K
J
I
H
G
F
E
D
C
B
A
1
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4
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9
10
11
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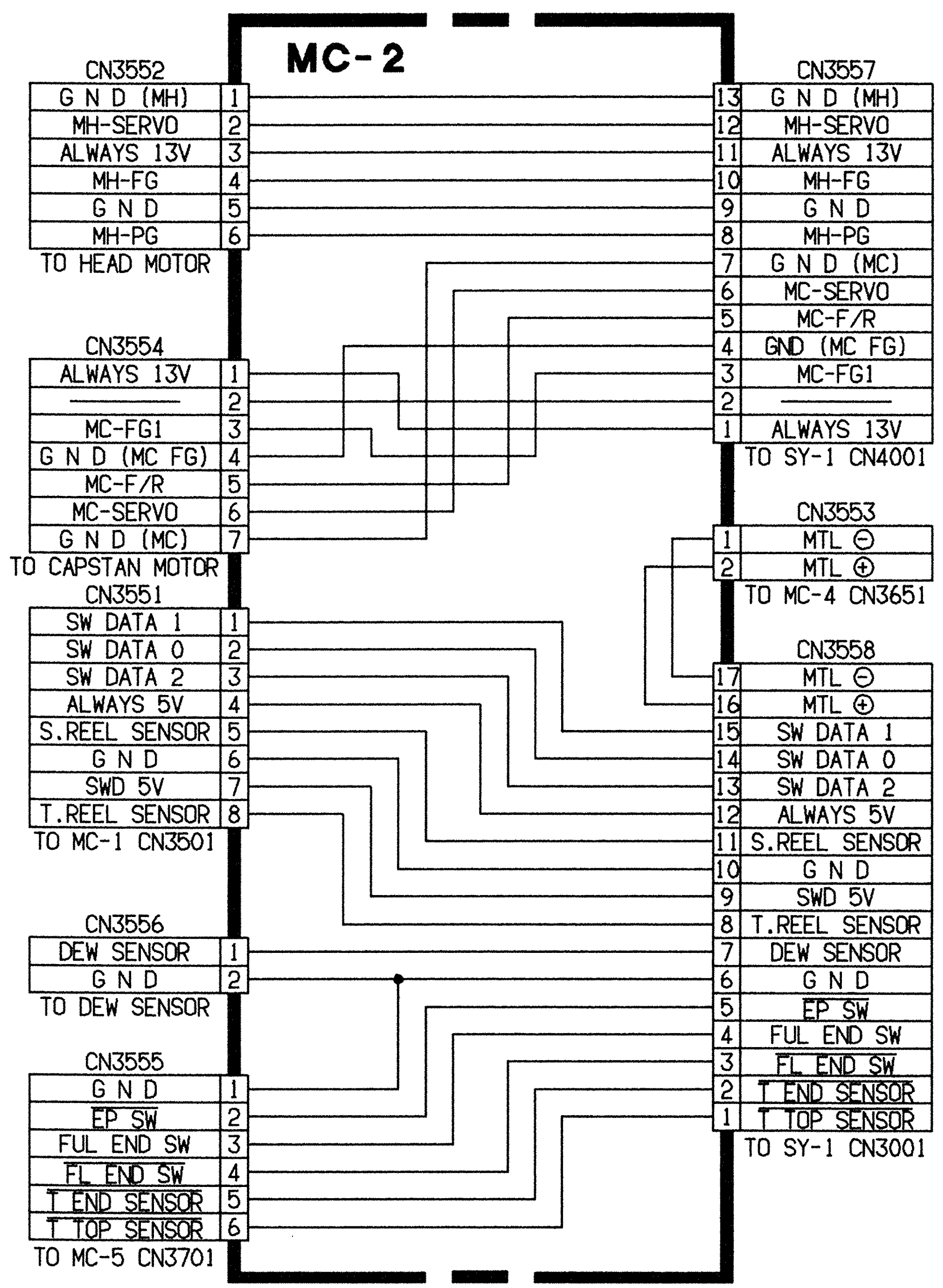
14
15
16
17
18
19
20
21
22
23
RF
TU PACK
TN-2
IF (TN-1)
VD-1 (VIDEO)
(AUDIO)
(IF.TUNER)
CN2001 YELLOW: 1 R/P HEAD, 2 R/P HEAD, 3 A.E F.E, 4 GND
CN2003 WHITE: 1 D.O.P, 2 PB H, 3 REC, 4 A. MUTE, 5 POWER UP, 6 ——, 7 INDEX A. MUTE
CN2002 WHITE: 1 GND, 2 ALWAYS 12V, 3 ALWAYS 5.8V
CN6080 YELLOW: 1 ALWAYS 5V, 2 GND, 3 ALWAYS 33V, 4 ALWAYS 12V, 5 ALWAYS -30V, 6 VIDEO OUT, 7 S. OUT, 8 S. IN, 9 S. CLK, 10 AV, 11 MONORAL
CN1002 BLUE: 1 RF SW PULSE, 2 V. L. P, 3 COMP. SYNC, 4 FSC (4.43MHZ), 5 GND
CN1001 RED: 1 RF SW PULSE, 2 PB EE 5V, 3 PB C, 4 GND, 5 PB Y, 6 REC Y, 7 GND, 8 REC C, 9 REC 12V
CN1003 BLACK: 1 PICTURE VR, 2 SWD 5V
MC-3
CN3601 WHITE: 1 FE, 2 GND
MC-6
CN3752 WHITE: 1 FE, 2 GND
CN3751 RED: 6 R/P HEAD, 5 R/P HEAD, 4 A.E F.E, 3 GND, 2 CTL (+), 1 CTL (-)
SY-1 (SYSTEM CONTROL)
(SERVO)
CN3003 (P): 1 D.O.P, 2 PB H, 3 REC, 4 A. MUTE, 5 POWER UP, 6 ——, 7 INDEX A. MUTE
CN3002 WHITE: 1 S. CLK, 2 S. IN, 3 S. OUT
CN4002 WHITE: 1 CTL (+), 2 CTL (-)
CN4006 (P): 1 RF SW PULSE, 2 V. L. P, 3 COMP. SYNC, 4 FSC (4.43MHZ), 5 GND
CN3001: 1 MTL (-), 2 MTL (+), 3 DATA 1, 4 DATA 0, 5 DATA 2, 6 ALWAYS 5V, 7 S.REEL SENSOR, 8 GND, 9 SWD 5V, 10 T.REEL SENSOR, 11 DEW SENSOR, 12 GND, 13 EP SW, 14 FUL END SW, 15 FL END SW, 16 TAPE END SENSOR, 17 TAPE TOP SENSOR
CN4001: 1 GND (MH), 2 MH-SERVO, 3 ALWAYS 13V, 4 MH-FG, 5 GND, 6 MH-PG, 7 GND (MC), 8 MC-SERVO, 9 MC-F/R, 10 GND (MC FG), 11 MC-FG 1, 12 ——, 13 ALWAYS 13V
CN4004 WHITE: 1 GND (MOTOR), 2 ALWAYS 13V, 3 GND, 4 ALWAYS 5V
CN4003 RED: 1 TRACKING (-), 2 TRACKING (+)
CN1602: 4, 3, 2, 1
CN3941: 1 V CH 1, 2 COMMON, 3 V CH 2, 4 GND
MC-30
CN1601 RED: 1 RF SW PULSE, 2 PB EE 5V, 3 PB C, 4 GND, 5 PB Y, 6 REC Y, 7 GND, 8 REC C, 9 REC 12V
VP-1
(VIDEO PRE AMP)
MC-1
MC-2
CN3501
CN3551
1 SW DATA 1 1
2 SW DATA 0 2
3 SW DATA 2 3
4 ALWAYS 5V 4
5 S.REEL SENSOR 5
6 GND 6
7 SWD 5V 7
8 T.REEL SENSOR 8
CN3558: 17 MTL (-), 16 MTL (+), 15 DATA 1, 14 DATA 0, 13 DATA 2, 12 ALWAYS 5V, 11 S.REEL SENSOR, 10 GND, 9 SWD 5V, 8 T.REEL SENSOR, 7 DEW SENSOR, 6 GND, 5 EP SW, 4 FUL END SW, 3 FL END SW, 2 TAPE END SENSOR, 1 TAPE TOP SENSOR
CN3557: 13 GND (MH), 12 MH-SERVO, 11 ALWAYS 13V, 10 MH-FG, 9 GND, 8 MH-PG, 7 GND (MC), 6 MC-SERVO, 5 MC-F/R, 4 GND (MC FG), 3 MC-FG 1, 2 ——, 1 ALWAYS 13V
T.S LED (A) 1
T.S LED (K) 2
CN3556 YELLOW: 1 DEW SNS, 2 GND
CN3553 (P): 1 MTL (-), 2 MTL (+)
CN3555 (P): 1 GND, 2 EP SW, 3 FUL END SW, 4 FL END SW, 5 TAPE END SENSOR, 6 TAPE TOP SENSOR
CN3552 (P): 1 GND (MH), 2 SV (MH), 3 ALWAYS 13V, 4 FG (MH), 5 GND, 6 PG (MH)
CN3554 (P): 1 ALWAYS 13V, 2 ——, 3 FG 1 (MC), 4 GND (MC FG), 5 F/R (MC), 6 SV (MC), 7 GND
M.SW
MC-7
E
DEW.
CN3651 RED: 1 MTL (+), 2 MTL (-)
MC-4
CN3701 WHITE: 1 GND, 2 EP SW, 3 FUL END SW, 4 FL END SW, 5 TAPE END SENSOR, 6 TAPE TOP SENSOR
MC-5
CN4451 WHITE: 1 GND (MH), 2 SV (MH), 3 ALWAYS 13V, 4 FG (MH), 5 GND, 6 PG (MH)
SV-5 MH
CN4401 BLACK: 1 ALWAYS 13V, 2 ——, 3 FG 1 (MC), 4 GND (MC FG), 5 F/R (MC), 6 SV (MC), 7 GND
SV-4 MC
CN5002 (P): 1 GND, 2 ALWAYS 12V, 3 ALWAYS 5.8V
PW-1
(POWER SUPPLY)
CN5001 (P): 1 GND (MOTOR), 2 ALWAYS 13V, 3 GND, 4 ALWAYS 5V, 5 AC 4V, 6 AC 4V, 7 ALWAYS 5.8V, 8 GND, 9 ALWAYS 33V, 10 ALWAYS 12V, 11 ALWAYS -30V
CN7002 RED: 1 TRACKING (-), 2 TRACKING (+)
CN7003 BLACK: 1 PICTURE VR, 2 SWD 5V
TM-5
(OPERATION CONTROL)
CN7001 WHITE: 1 KEY IN 3, 2 g2, 3 g1, 4 GND
CN7403 WHITE (L): 1 S. CLK, 2 S. OUT, 3 S. IN
CN7402 YELLOW (L): 1 ALWAYS 5V, 2 GND, 3 ALWAYS 33V, 4 ALWAYS 12V, 5 ALWAYS -30V, 6 VIDEO IN, 7 S. IN, 8 S. OUT, 9 S. CLK, 10 AV, 11 MONORAL
CN7401 WHITE (L): 1 AC 4V, 2 AC 4V, 3 ALWAYS 5.8V, 4 GND, 5 ALWAYS 33V, 6 ALWAYS 12V, 7 ALWAYS -30V
CN7405 (P) (L): 1 KEY IN 3, 2 g2, 3 g1, 4 GND
TM-4 (TIMER/DISPLAY)

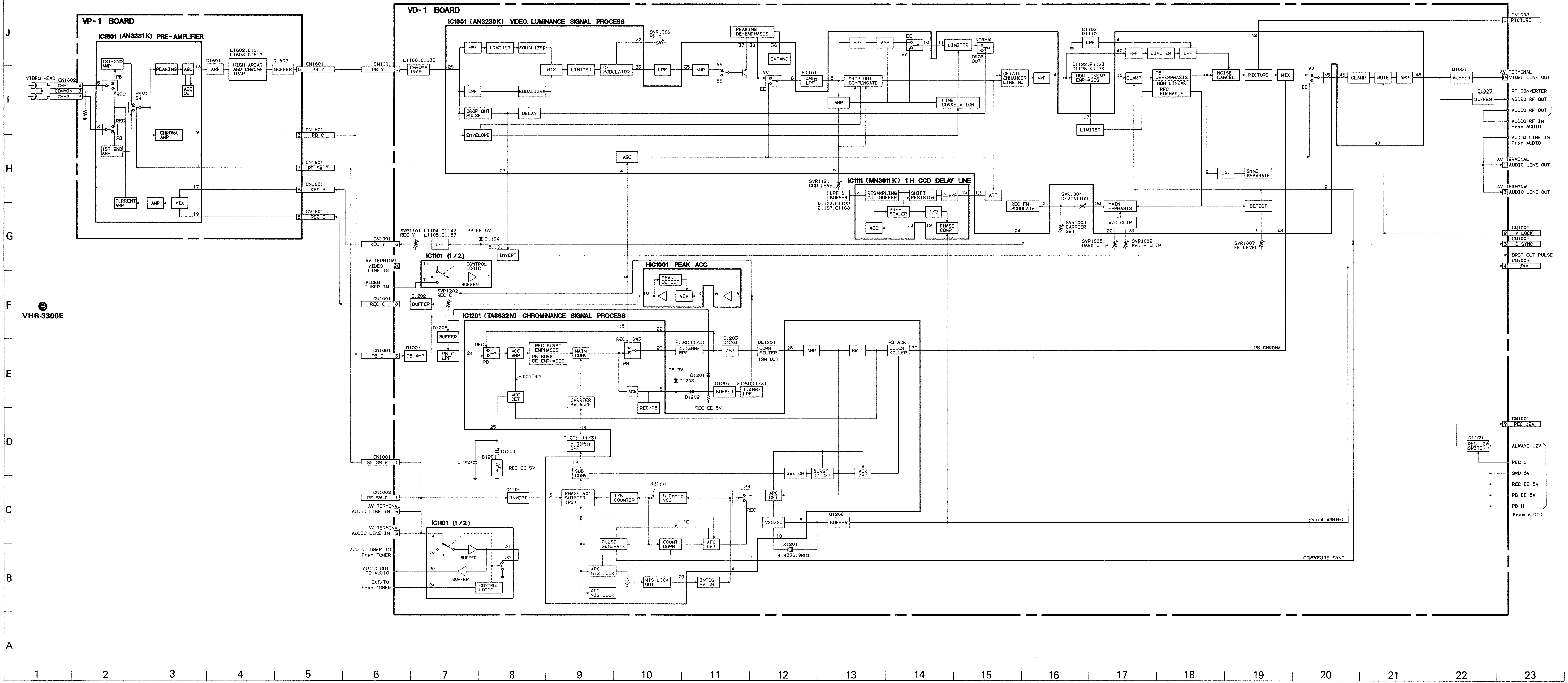
## P.C.B. MC-2 CONNECTION CIRCUIT (143-0-233V-26750)


MC-2
CN3552
1 G N D (MH)
2 MH-SERVO
3 ALWAYS 13V
4 MH-FG
5 G N D
6 MH-PG
TO HEAD MOTOR
CN3554
1 ALWAYS 13V
2 ——
3 MC-FG1
4 G N D (MC FG)
5 MC-F/R
6 MC-SERVO
7 G N D (MC)
TO CAPSTAN MOTOR
CN3551
1 SW DATA 1
2 SW DATA 0
3 SW DATA 2
4 ALWAYS 5V
5 S.REEL SENSOR
6 G N D
7 SWD 5V
8 T.REEL SENSOR
TO MC-1 CN3501
CN3556
1 DEW SENSOR
2 G N D
TO DEW SENSOR
CN3555
1 G N D
2 EP SW
3 FUL END SW
4 FL END SW
5 T END SENSOR
6 T TOP SENSOR
TO MC-5 CN3701
CN3557
13 G N D (MH)
12 MH-SERVO
11 ALWAYS 13V
10 MH-FG
9 G N D
8 MH-PG
7 G N D (MC)
6 MC-SERVO
5 MC-F/R
4 GND (MC FG)
3 MC-FG1
2 ——
1 ALWAYS 13V
TO SY-1 CN4001
CN3553
1 MTL ⊖
2 MTL ⊕
TO MC-4 CN3651
CN3558
17 MTL ⊖
16 MTL ⊕
15 SW DATA 1
14 SW DATA 0
13 SW DATA 2
12 ALWAYS 5V
11 S.REEL SENSOR
10 G N D
9 SWD 5V
8 T.REEL SENSOR
7 DEW SENSOR
6 G N D
5 EP SW
4 FUL END SW
3 FL END SW
2 T END SENSOR
1 T TOP SENSOR
TO SY-1 CN3001

Ⓐ VHR-3300E

K
J
I
H
G
F
E
D
C
B
A

# VIDEO CIRCUIT BLOCK DIAGRAM (VD-1 & VP-1 BOARDS)


VP-1 BOARD
IC1601 (AN3331K) PRE-AMPLIFIER
VIDEO HEAD
CN1602
CH-1
COMMON
CH-2
1ST-2ND AMP
PB
REC
HEAD SW
PEAKING
AGC
AGC DET
CHROMA AMP
CURRENT AMP
AMP
MIX
Q1601
AMP
L1602.C1611
L1603.C1612
HIGH AREAR AND CHROMA TRAP
Q1602
BUFFER
CN1601
PB Y
PB C
RF SW P
REC Y
REC C
VD-1 BOARD
IC1001 (AN3230K) VIDEO. LUMINANCE SIGNAL PROCESS
CN1001
L1108.C1135
CHROMA TRAP
HPF
LIMITER
EQUALIZER
LPF
MIX
DE MODULATOR
DROP OUT PULSE
DELAY
ENVELOPE
AGC
SVR1006
PB Y
PEAKING DE-EMPHASIS
EXPAND
VV
EE
F1101
4MHz LPF
DROP OUT COMPENSATE
LINE CORRELATION
NORMAL
DROP OUT
DETAIL ENHANCER LINE NC
C1102
R1110
C1122.R1123
C1128.R1139
NON LINEAR EMPHASIS
CLAMP
PB DE-EMPHASIS
NON LINEAR
REC EMPHASIS
NOISE CANCEL
PICTURE
MUTE
Q1001
BUFFER
Q1003
CN1003
PICTURE
AV TERMINAL
VIDEO LINE OUT
RF CONVERTER
VIDEO RF OUT
AUDIO RF OUT
AUDIO RF IN
From AUDIO
AUDIO LINE IN
From AUDIO
AUDIO LINE OUT
SYNC SEPARATE
DETECT
SVR1121
CCD LEVEL
IC1111 (MN3811K) 1H CCD DELAY LINE
LPF & BUFFER
Q1122.L1122
C1167.C1168
RESAMPLING OUT BUFFER
SHIFT RESISTOR
PRE-SCALER
1/2
VCO
PHASE COMP
ATT
REC FM MODULATE
SVR1004
DEVIATION
SVR1003
CARRIER SET
MAIN EMPHASIS
W/D CLIP
SVR1005
DARK CLIP
SVR1002
WHITE CLIP
SVR1007
EE LEVEL
CN1002
V LOCK
C SYNC
DROP OUT PULSE
fsc
SVR1101
REC Y
L1104.C1142
L1105.C1157
PB EE 5V
D1104
B1101
INVERT
IC1101 (1/2)
AV TERMINAL
VIDEO LINE IN
VIDEO TUNER IN
CONTROL LOGIC
HIC1001 PEAK ACC
PEAK DETECT
VCA
Q1202
SVR1202
REC C
Q1208
Q1021
PB AMP
PB C LPF
IC1201 (TA8632N) CHROMINANCE SIGNAL PROCESS
ACC AMP
REC BURST EMPHASIS
PB BURST DE-EMPHASIS
MAIN CONV
SW3
F1201 (1/3)
4.43MHz BPF
Q1203
Q1204
DL1201
COMB FILTER (2H DL)
SW 1
PB ACK
COLOR KILLER
PB CHROMA
CONTROL
ACC DET
CARRIER BALANCE
ACK
REC/PB
PB 5V
D1203
D1201
D1202
Q1207
F1201 (1/3)
1.4MHz LPF
REC EE 5V
F1201 (1/3)
5.06MHz BPF
C1253
B1201
C1252
SUB CONV
SWITCH
BURST ID DET
ACK DET
RF SW P
Q1205
PHASE 90° SHIFTER (PS)
1/8 COUNTER
321fH
5.06MHz VCO
APC DET
VXO/XO
Q1206
X1201
4.433619MHz
fsc (4.43MHz)
COMPOSITE SYNC
HD
PULSE GENERATE
COUNT DOWN
AFC DET
APC MIS LOCK
AFC MIS LOCK
MIS LOCK OUT
INTEG-RATOR
AUDIO LINE IN
AUDIO TUNER IN
From TUNER
AUDIO OUT
TO AUDIO
EXT/TU
From TUNER
REC 12V
Q1105
REC 12V SWITCH
ALWAYS 12V
REC L
SWD 5V
REC EE 5V
PB EE 5V
PB H
From AUDIO
B
VHR-3300E
1
2
3
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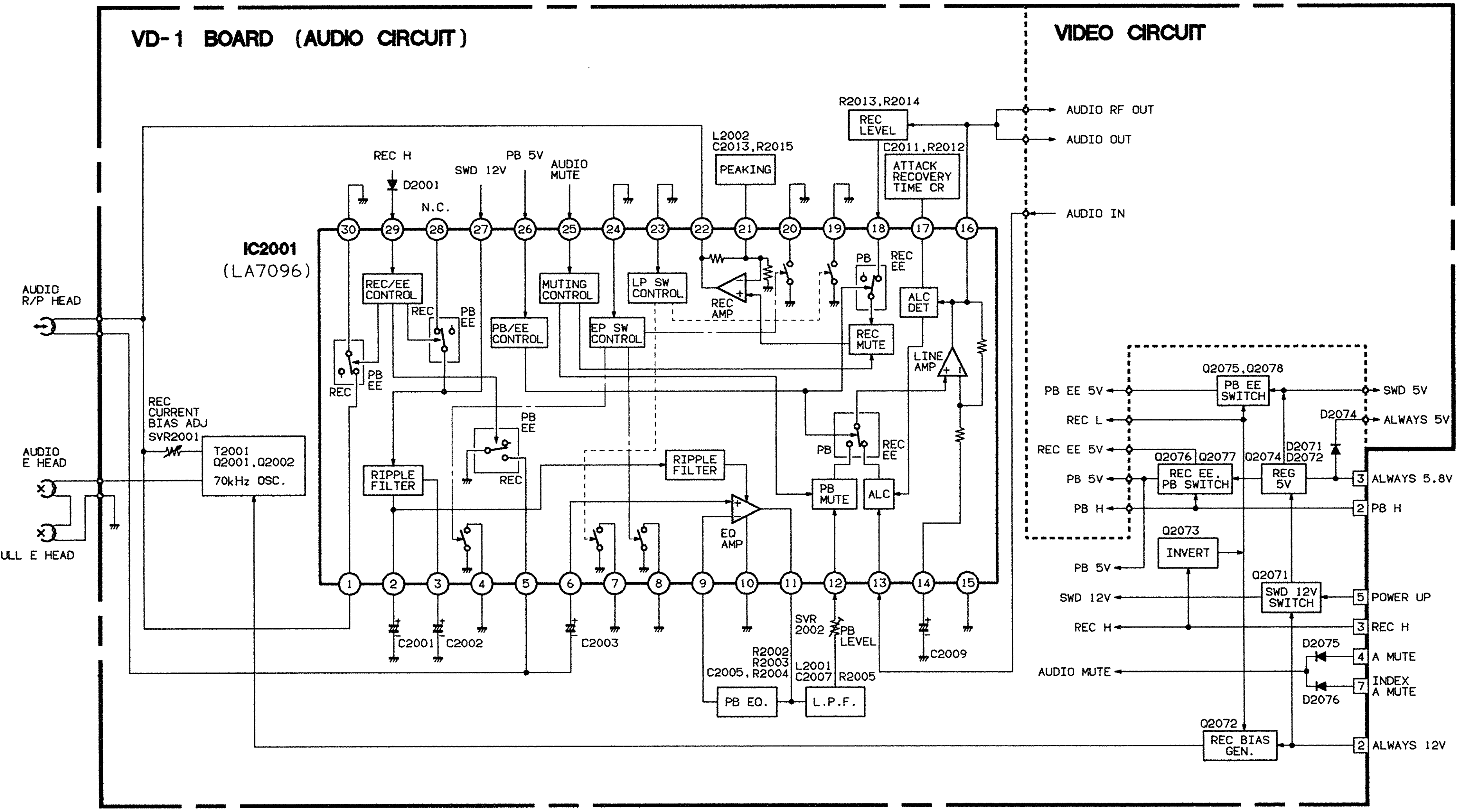
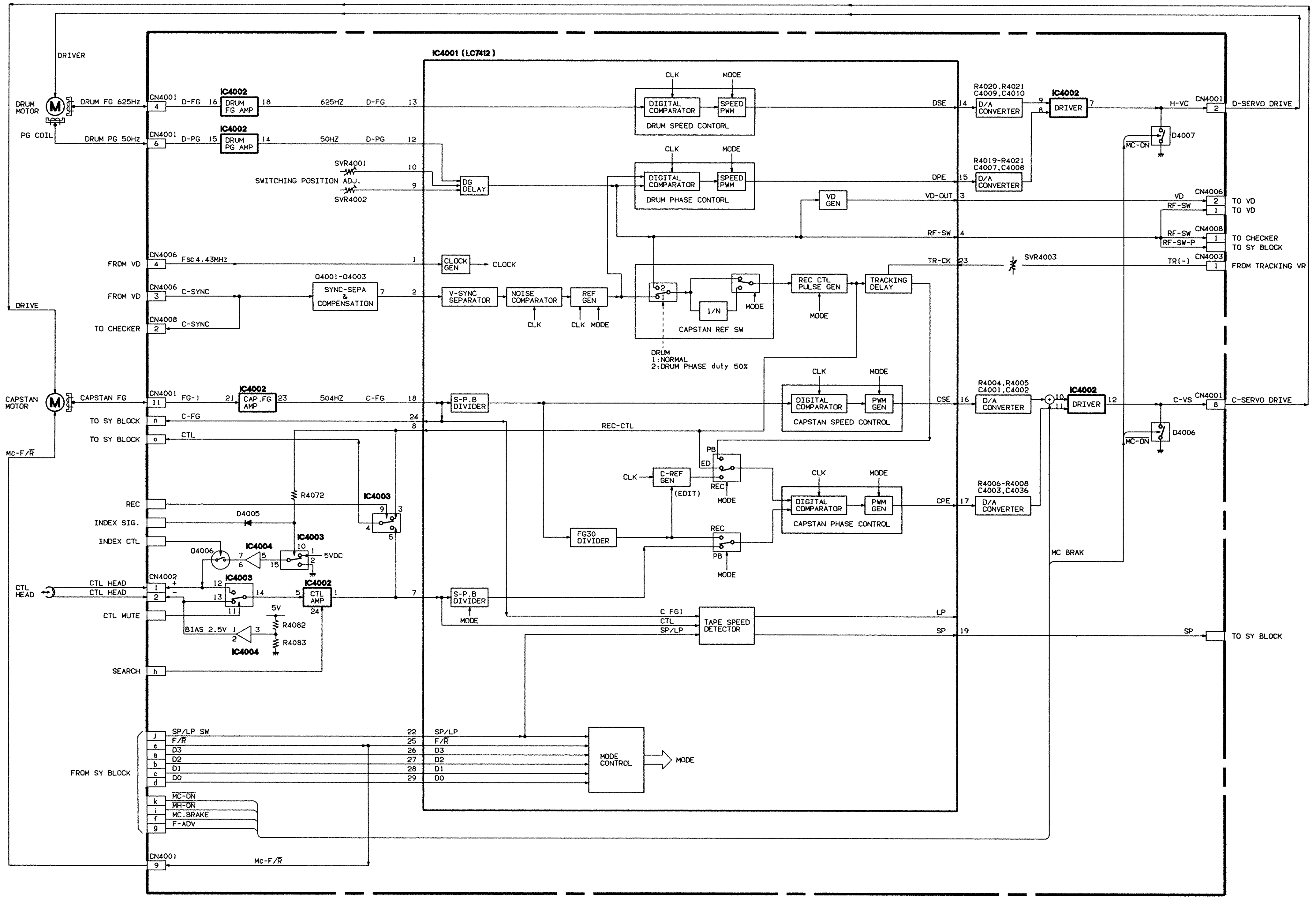
22
23

## AUDIO CIRCUIT BLOCK DIAGRAM (VD-1 BOARD)


VD-1 BOARD (AUDIO CIRCUIT)
VIDEO CIRCUIT
IC2001
(LA7096)
AUDIO R/P HEAD
AUDIO E HEAD
FULL E HEAD
REC CURRENT BIAS ADJ SVR2001
T2001 Q2001,Q2002 70kHz OSC.
REC H
D2001
N.C.
SWD 12V
PB 5V
AUDIO MUTE
L2002 C2013,R2015
PEAKING
R2013,R2014
REC LEVEL
C2011,R2012
ATTACK RECOVERY TIME CR
REC/EE CONTROL
PB/EE CONTROL
MUTING CONTROL
LP SW CONTROL
EP SW CONTROL
REC AMP
REC MUTE
ALC DET
LINE AMP
RIPPLE FILTER
EQ AMP
PB MUTE
ALC
C2001
C2002
C2003
C2009
SVR 2002 PB LEVEL
R2002 R2003 C2005, R2004
L2001 C2007 R2005
PB EQ.
L.P.F.
AUDIO RF OUT
AUDIO OUT
AUDIO IN
PB EE 5V
REC L
REC EE 5V
PB 5V
PB H
Q2075,Q2078
PB EE SWITCH
Q2076 Q2077
REC EE, PB SWITCH
Q2074
D2071 D2072
D2074
REG 5V
Q2073
INVERT
Q2071
SWD 12V SWITCH
SWD 12V
REC H
AUDIO MUTE
D2075
D2076
Q2072
REC BIAS GEN.
SWD 5V
ALWAYS 5V
ALWAYS 5.8V
PB H
POWER UP
REC H
A MUTE
INDEX A MUTE
ALWAYS 12V

## SERVO CIRCUIT BLOCK DIAGRAM (SY-1 BOARD)


IC4001 (LC7412)
DRIVER
DRUM MOTOR
PG COIL
DRUM FG 625Hz
DRUM PG 50Hz
CN4001
IC4002
DRUM FG AMP
DRUM PG AMP
D-FG
D-PG
625HZ
50HZ
SVR4001
SWITCHING POSITION ADJ.
SVR4002
DG DELAY
CLK
MODE
DIGITAL COMPARATOR
SPEED PWM
DRUM SPEED CONTROL
DRUM PHASE CONTROL
DSE
DPE
VD GEN
VD-OUT
RF-SW
TR-CK
SVR4003
R4020,R4021 C4009,C4010
R4019,R4021 C4007,C4008
D/A CONVERTER
DRIVER
H-VC
D-SERVO DRIVE
MC-ON
D4007
CN4006
VD
TO VD
CN4008
RF-SW-P
TO CHECKER
TO SY BLOCK
CN4003
TR(-)
FROM TRACKING VR
DRIVE
FROM VD
Fsc 4.43MHz
CLOCK GEN
CLOCK
C-SYNC
Q4001-Q4003
SYNC-SEPA & COMPENSATION
V-SYNC SEPARATOR
NOISE COMPARATOR
REF GEN
1/N
CAPSTAN REF SW
DRUM 1:NORMAL 2:DRUM PHASE duty 50%
REC CTL PULSE GEN
TRACKING DELAY
TO CHECKER
CAPSTAN MOTOR
CAPSTAN FG
FG-1
CAP FG AMP
504HZ
C-FG
S-P.B DIVIDER
TO SY BLOCK
CTL
REC-CTL
CAPSTAN SPEED CONTROL
CAPSTAN PHASE CONTROL
PWM GEN
CSE
CPE
R4004,R4005 C4001,C4002
R4006-R4008 C4003,C4036
C-VS
C-SERVO DRIVE
D4006
Mc-F/R
REC
INDEX SIG.
INDEX CTL
R4072
D4005
IC4003
IC4004
Q4006
5VDC
C-REF GEN
(EDIT)
PB
EE
FG30 DIVIDER
CTL HEAD
CTL MUTE
CTL AMP
BIAS 2.5V
R4082
R4083
5V
C FG1
TAPE SPEED DETECTOR
LP
SP
TO SY BLOCK
MC BRAK
SEARCH
FROM SY BLOCK
SP/LP SW
F/R
D3
D2
D1
D0
MC-ON
MH-ON
MC.BRAKE
F-ADV
MODE CONTROL
MODE

Ⓒ
VHR-3300E

K J I H G F E D C B A

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

K

J

I

H

G

F

E

D

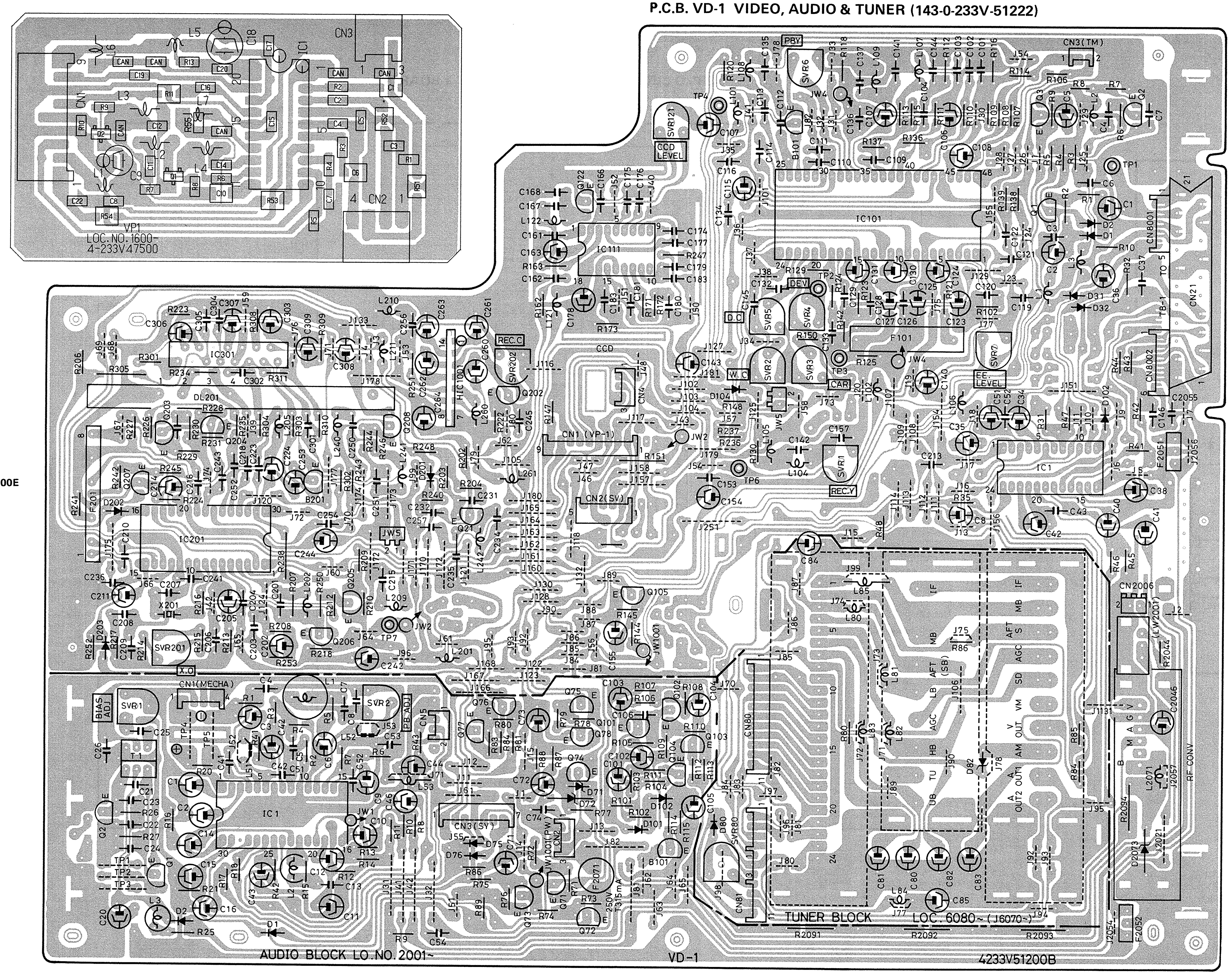
C

B

A

## P.C.B. VP-1 VIDEO PRE-AMP (143-0-233V-47500)

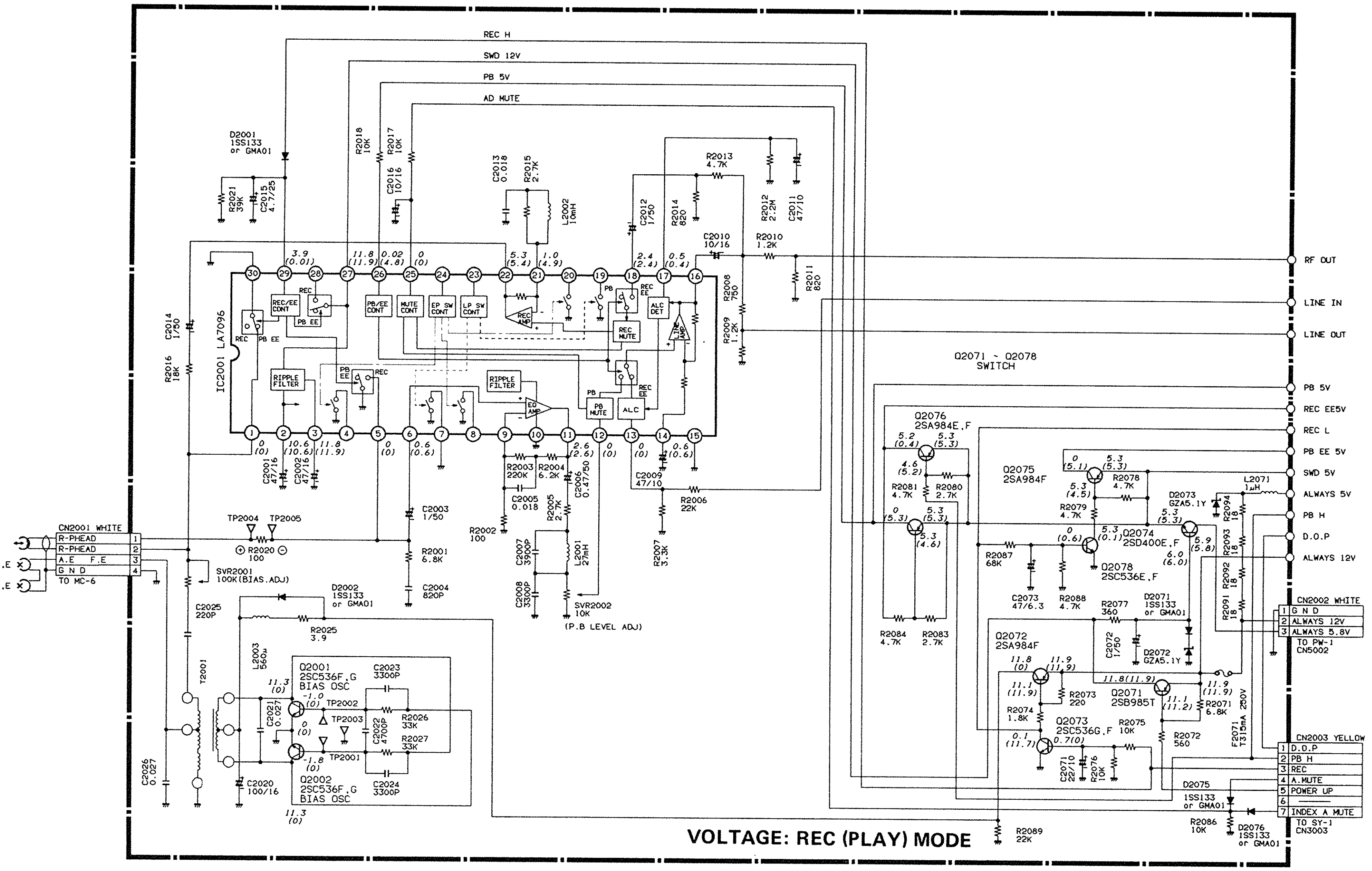
## P.C.B. VD-1 VIDEO, AUDIO & TUNER (143-0-233V-51222)



LOC. NO. 1600-
4-233V47500
VP1
CN1
CN2
CN3
IC1
CN3(TM)
IC101
IC111
IC301
IC201
IC1
DL201
CCD
CN1 (VP-1)
CN2(SV)
CN1(MECHA)
CN3(SY)
CN4
CN80
CN81
CN8001
CN8002
CN2006
REC.C
CCD LEVEL
PBY
DEV
CAR
EE LEVEL
REC.Y
W.C
D.C
BIAS ADJ
PB ADJ
X.O
SVR1
SVR2
SVR3
SVR4
SVR5
SVR6
SVR7
SVR80
SVR121
SVR201
SVR202
F101
TUNER BLOCK
LOC. 6080~(J6070~)
AUDIO BLOCK LO.NO.2001~
VD-1
4233V51200B
RF CONV

**D**
VHR-3300E

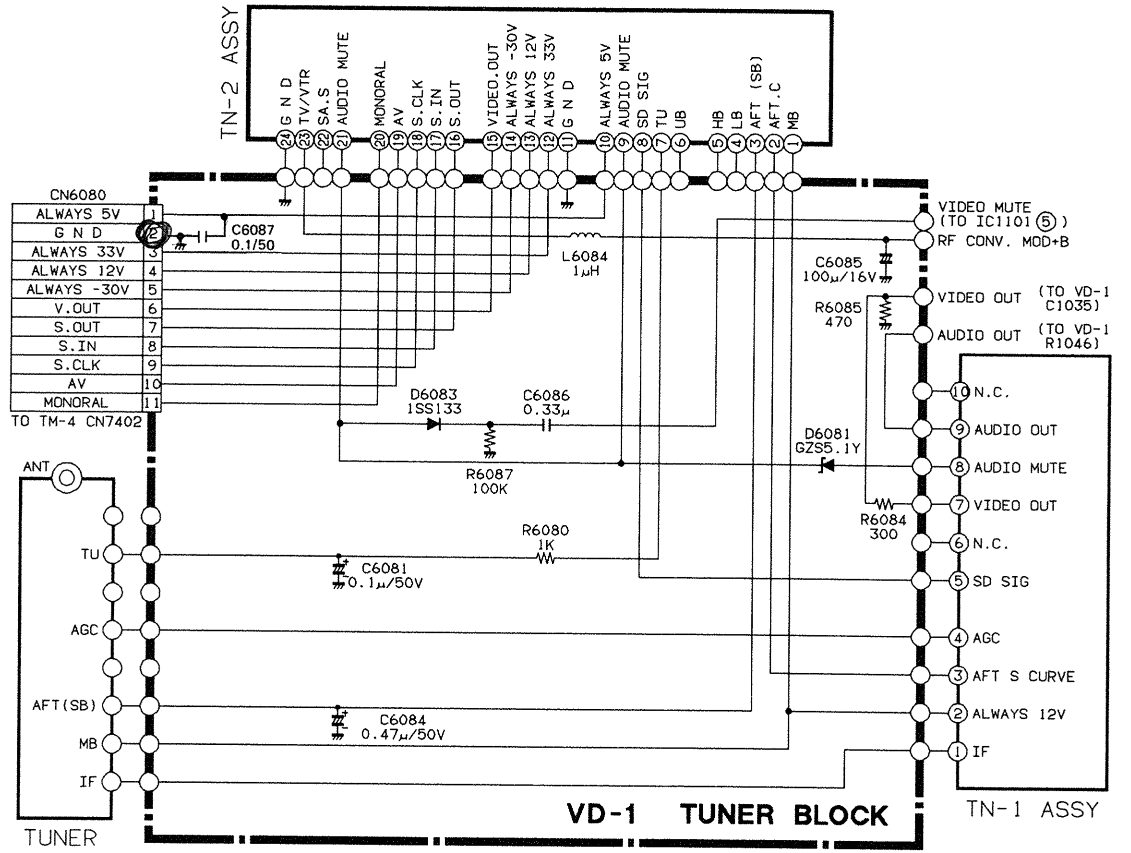
## P.C.B. VD-1 AUDIO CIRCUIT (143-0-233V-51222)



REC H
SWD 12V
PB 5V
AD MUTE
IC2001 LA7096
Q2001 2SC536F,G BIAS OSC
Q2002 2SC536F,G BIAS OSC
Q2071 ~ Q2078 SWITCH
CN2001 WHITE
R-PHEAD
R-PHEAD
A.E F.E
G N D
TO MC-6
A.E
F.E
SVR2001 100K(BIAS.ADJ)
SVR2002 10K (P.B LEVEL ADJ)
RF OUT
LINE IN
LINE OUT
PB 5V
REC EE5V
REC L
PB EE 5V
SWD 5V
ALWAYS 5V
PB H
D.O.P
ALWAYS 12V
CN2002 WHITE
G N D
ALWAYS 12V
ALWAYS 5.8V
TO PW-1 CN5002
CN2003 YELLOW
D.O.P
PB H
REC
A.MUTE
POWER UP
INDEX A MUTE
TO SY-1 CN3003

VOLTAGE: REC (PLAY) MODE

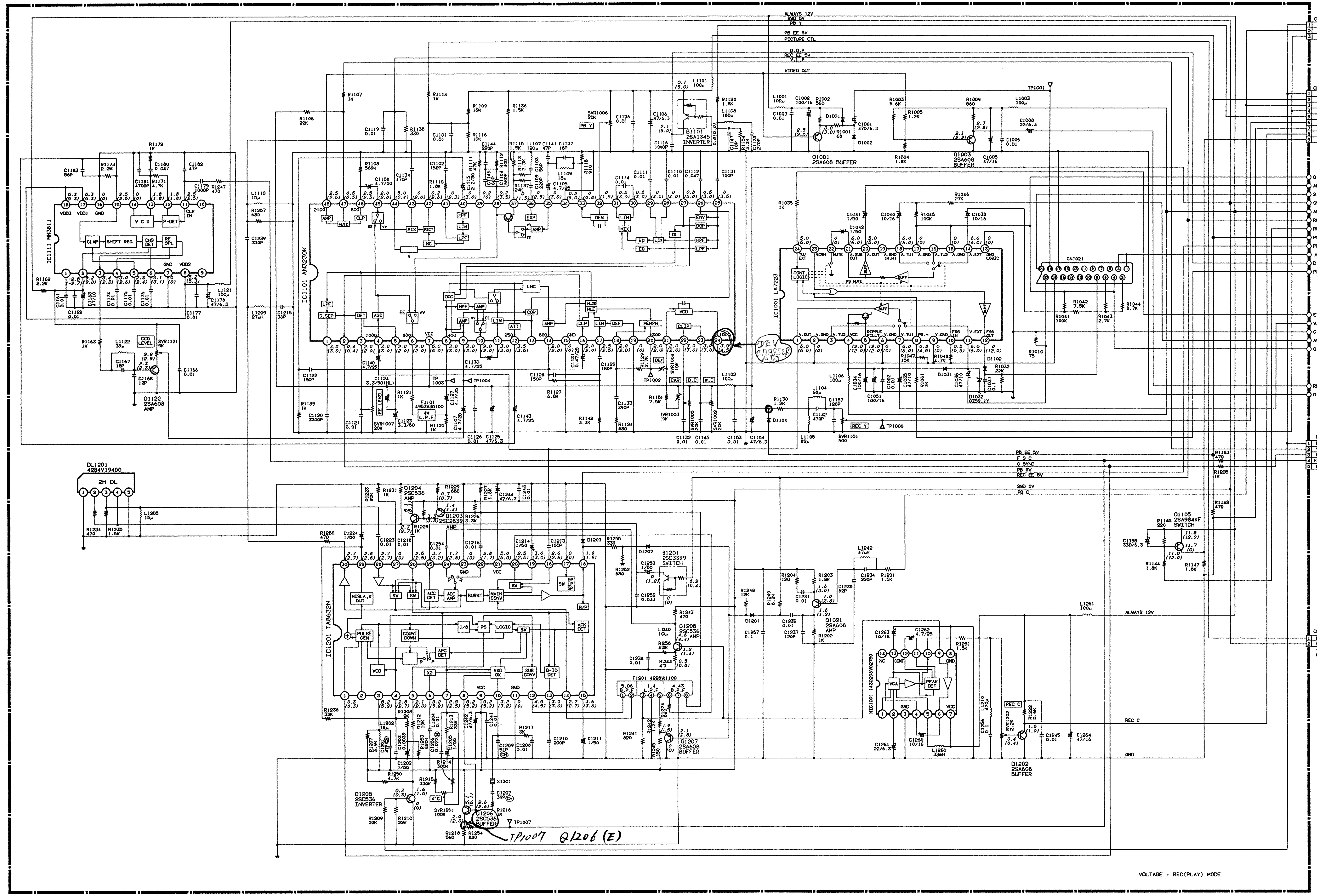
## P.C.B. VD-1 TUNER CIRCUIT (143-0-233V-51222)



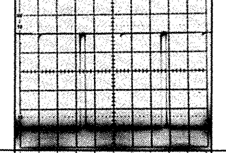
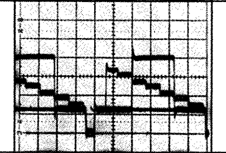
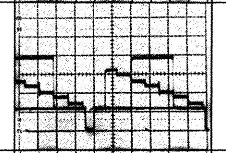
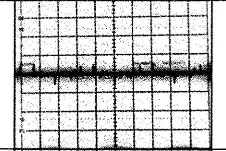
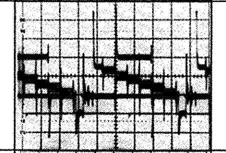
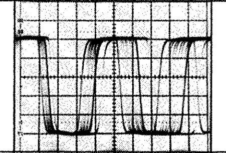
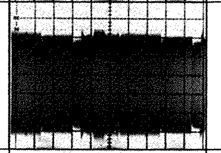
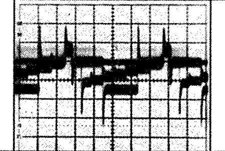
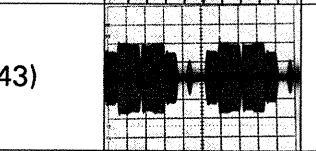
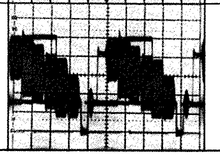
TN-2 ASSY
G N D
TV/VTR
SA.S
AUDIO MUTE
MONORAL
AV
S.CLK
S.IN
S.OUT
VIDEO.OUT
ALWAYS -30V
ALWAYS 12V
ALWAYS 33V
G N D
ALWAYS 5V
AUDIO MUTE
SD SIG
TU
UB
HB
LB
AFT (SB)
AFT.C
MB
CN6080
ALWAYS 5V
G N D
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
V.OUT
S.OUT
S.IN
S.CLK
AV
MONORAL
TO TM-4 CN7402
C6087 0.1/50
L6084 1μH
C6085 100μ/16V
R6085 470
VIDEO MUTE (TO IC1101 ⑤)
RF CONV. MOD+B
VIDEO OUT (TO VD-1 C1035)
AUDIO OUT (TO VD-1 R1046)
D6083 1SS133
C6086 0.33μ
R6087 100K
D6081 GZS5.1Y
R6084 300
R6080 1K
C6081 0.1μ/50V
C6084 0.47μ/50V
ANT
TU
AGC
AFT(SB)
MB
IF
TUNER
N.C.
AUDIO OUT
AUDIO MUTE
VIDEO OUT
N.C.
SD SIG
AGC
AFT S CURVE
ALWAYS 12V
IF
TN-1 ASSY
VD-1 TUNER BLOCK

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

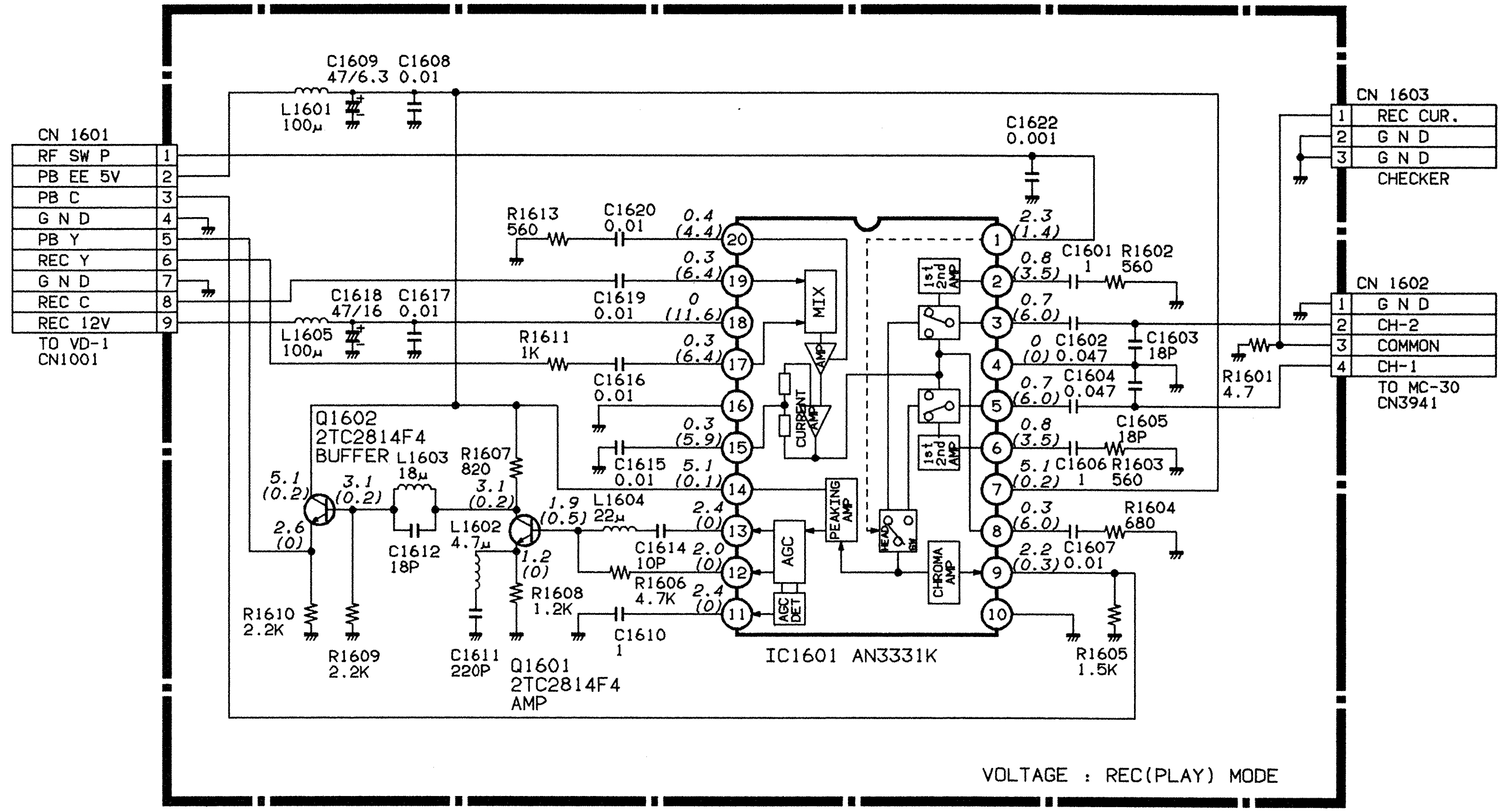
## P.C.B. VD-1 VIDEO CIRCUIT (143-0-233V-51222)


IC1101 AN3220K
IC1201 TA8532N
IC1001
DL1201 4284V19400
Q1001 2SA608 BUFFER
Q1003 2SA608 BUFFER
Q1121 2SA608 AMP
Q1202 2SA608 BUFFER
Q1205 2SC536 INVERTER
Q1105 2SA984KF SWITCH
TO AUDIO
TO TUNER
ALWAYS 12V
REC C
GND
VOLTAGE : REC(PLAY) MODE
TP1007 Q1206 (E)

## WAVEFORM OF VIDEO

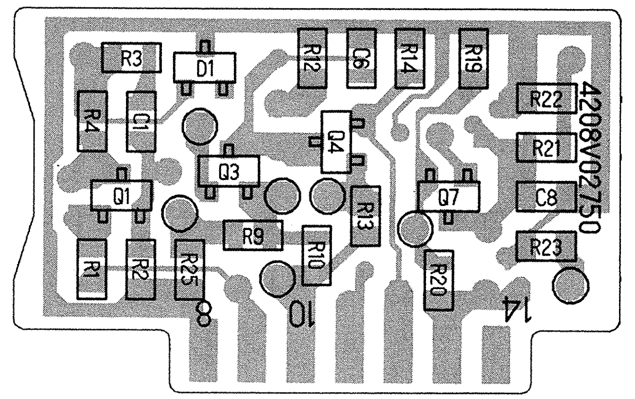
| Pin No. | | |
|---|---|---|
| IC1001<br>(2) |  | 5 Vp-p<br>15.625 KHz |
| (8) |  | PLAY<br>500 m Vp-p |
| (8) |  | REC<br>500 m Vp-p |
| (10)(11) |  | PLAY<br>50 m Vp-p |
| (21) |  | REC<br>700 m Vp-p |
| (24) |  | REC<br>1 Vp-p |
| (25) |  | PLAY<br>400 m Vp-p |
| (35) |  | PLAY<br>300 m Vp-p |
| (43) |  | PLAY<br>400 m Vp-p |
| TP1001 |  | PLAY<br>1 Vp-p |

## P.C.B. VP-1 VIDEO PRE-AMP CIRCUIT (143-0-233V-47500)

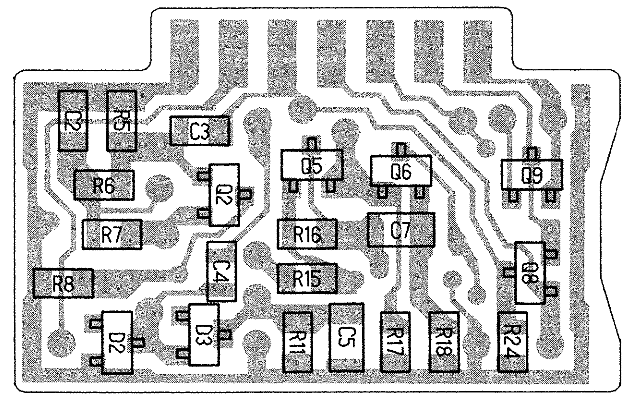

CN 1601
RF SW P
PB EE 5V
PB C
G N D
PB Y
REC Y
G N D
REC C
REC 12V
TO VD-1
CN1001
C1609 47/6.3
C1608 0.01
L1601 100μ
C1618 47/16
C1617 0.01
L1605 100μ
R1613 560
C1620 0.01
C1619 0.01
R1611 1K
C1616 0.01
C1615 0.01
C1622 0.001
Q1602
2TC2814F4
BUFFER
L1603 18μ
R1607 820
L1604 22μ
C1612 18P
L1602 4.7μ
C1614 10P
R1606 4.7K
R1608 1.2K
C1610 1
R1610 2.2K
R1609 2.2K
C1611 220P
Q1601
2TC2814F4
AMP
IC1601 AN3331K
MIX
AMP
CURRENT AMP
PEAKING AMP
AGC
AGC DET
HEAD SW
CHROMA AMP
1st 2nd AMP
C1601 1
R1602 560
C1602 0.047
C1603 18P
C1604 0.047
C1605 18P
C1606 1
R1603 560
R1604 680
C1607 0.01
R1605 1.5K
R1601 4.7
CN 1603
REC CUR.
G N D
G N D
CHECKER
CN 1602
G N D
CH-2
COMMON
CH-1
TO MC-30
CN3941
VOLTAGE : REC(PLAY) MODE

**E**
**VHR-3300E**

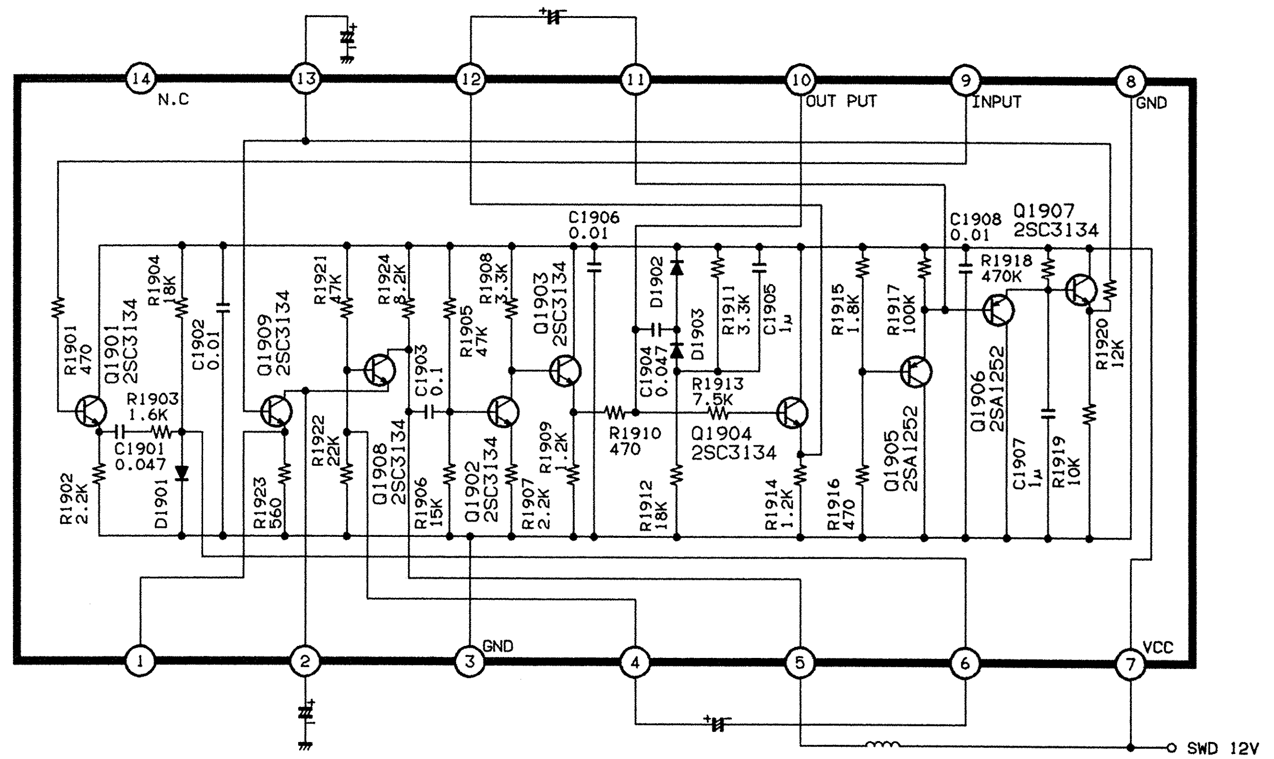
### SIDE A


R3
D1
R2
D6
R5
R19
R4
Q3
D4
R22
R21
4208V02750
Q1
R9
R11
R13
Q7
C8
R23
R1
R25
R20
8
10
14

### SIDE B

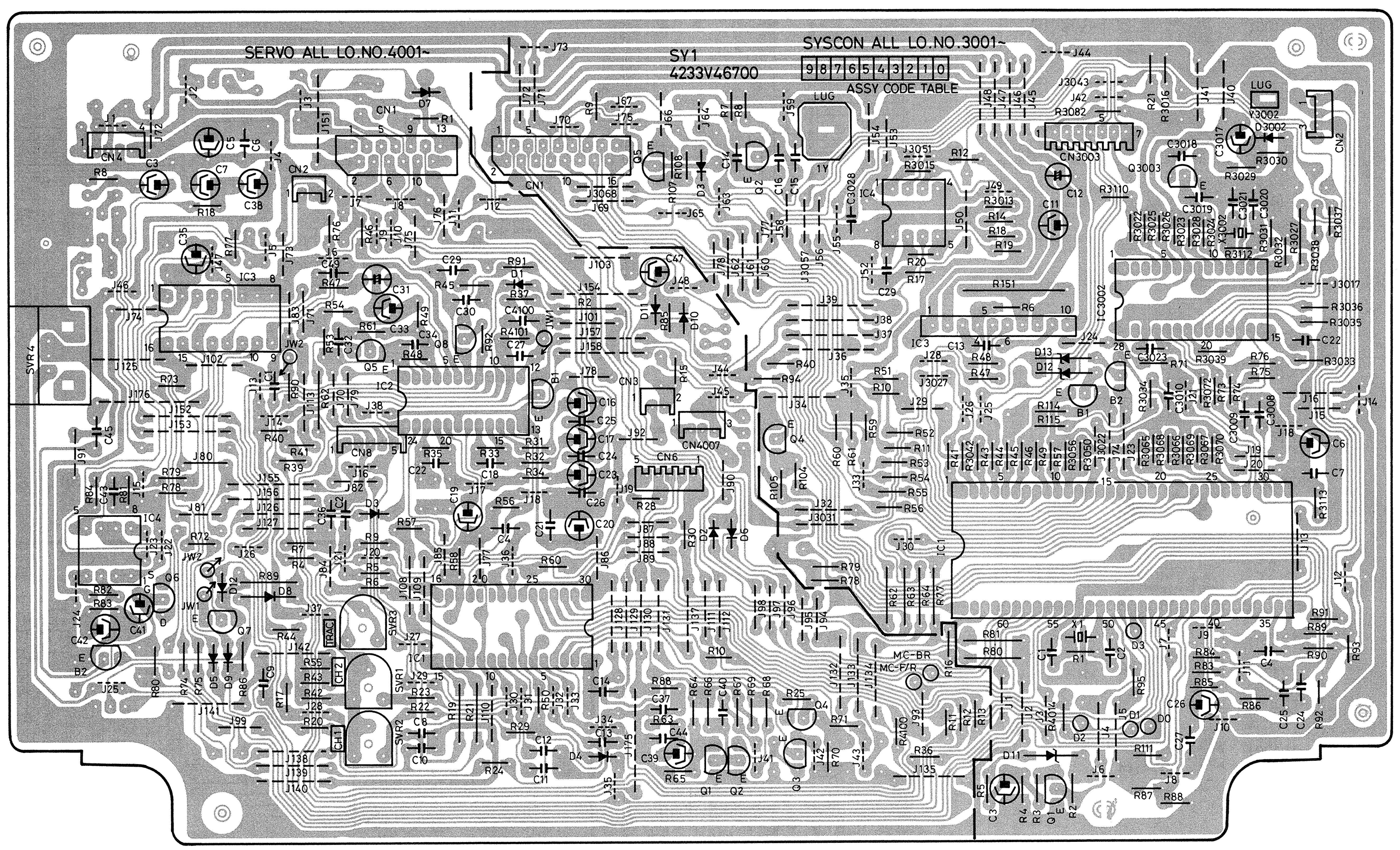

D2
R5
C3
R6
Q5
Q6
Q9
R7
Q2
R16
Q7
R8
C4
R15
D3
R11
C5
R17
R18
R24

## HYBRID IC OF VIDEO CIRCUIT & P.C.B. (143-0-208V-02750)

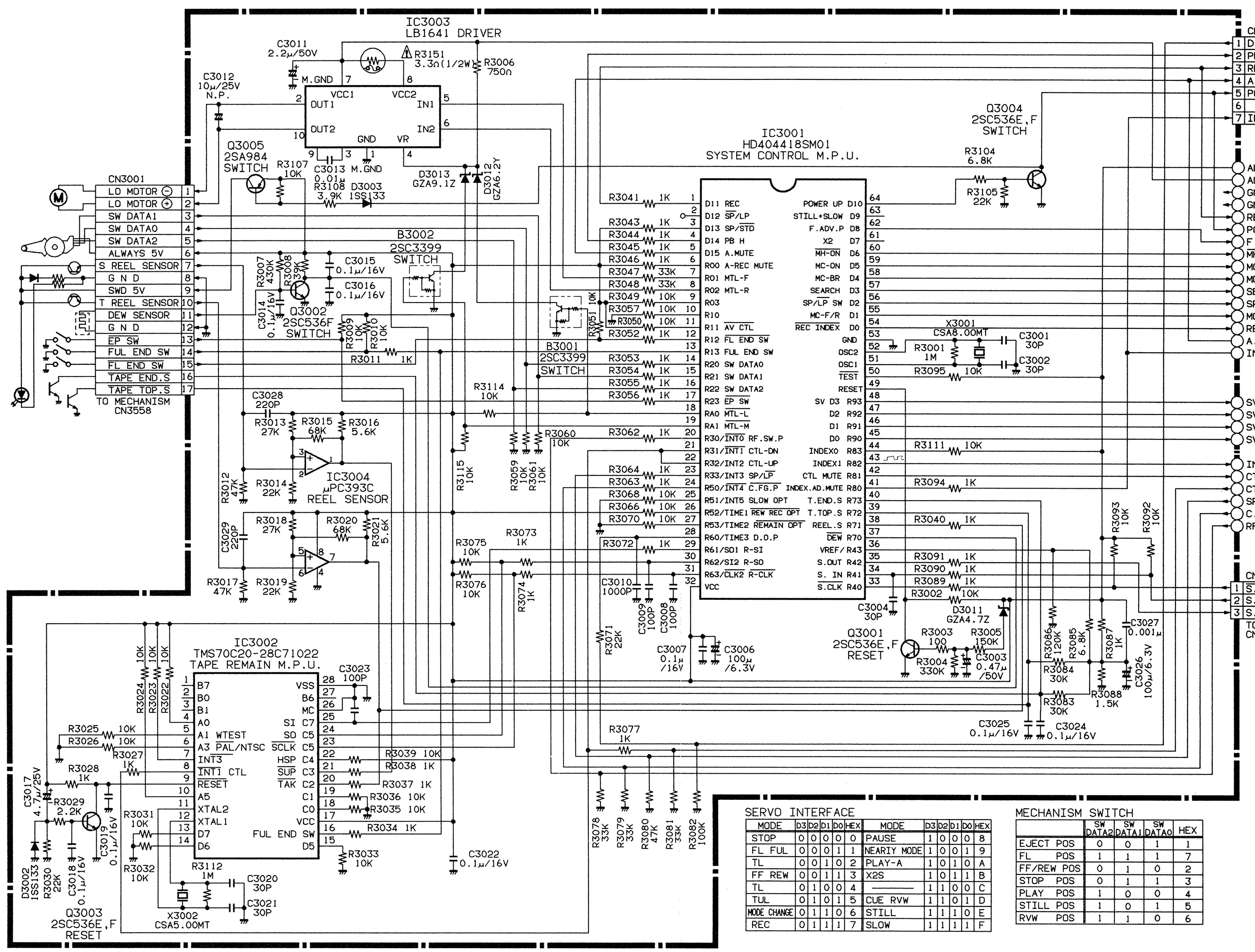

N.C
OUT PUT
INPUT
GND
GND
VCC
SWD 12V
R1901 470
Q1901 2SC3134
R1904 18K
R1903 1.6K
C1901 0.047
C1902 0.01
R1902 2.2K
D1901
Q1909 2SC3134
R1921 47K
R1924 8.2K
R1922 22K
R1923 560
Q1908 2SC3134
C1903 0.1
R1905 47K
R1906 15K
Q1902 2SC3134
R1908 3.3K
R1907 2.2K
Q1903 2SC3134
R1909 1.2K
C1906 0.01
R1910 470
D1902
D1903
C1904 0.047
R1911 3.3K
C1905 1μ
R1913 7.5K
R1912 18K
Q1904 2SC3134
R1914 1.2K
R1915 1.8K
R1916 470
R1917 100K
Q1905 2SA1252
C1908 0.01
R1918 470K
Q1906 2SA1252
C1907 1μ
R1919 10K
Q1907 2SC3134
R1920 12K

F VHR-3300E

## P.C.B. SY-1 SYSTEM CONTROL & SERVO (143-0-233V-46700)


SERVO ALL LO.NO.4001~
SY1
4233V46700
SYSCON ALL LO.NO.3001~
9 8 7 6 5 4 3 2 1 0
ASSY CODE TABLE
IC3
IC2
IC4
CN1
CN2
CN3
CN4
CN6
CN3003
CN4007
SVR1
SVR2
SVR3
SVR4
MC-BR
MC-F/R
LUG

## P.C.B. SY-1 SYSTEM CONTROL CIRCUIT (143-0-233V-46700)


IC3003
LB1641 DRIVER
IC3001
HD404418SM01
SYSTEM CONTROL M.P.U.
IC3002
TMS70C20-28C71022
TAPE REMAIN M.P.U.
IC3004
μPC393C
REEL SENSOR
CN3001
LO MOTOR ⊕
LO MOTOR ⊖
SW DATA1
SW DATA0
SW DATA2
ALWAYS 5V
S REEL SENSOR
G N D
SWD 5V
T REEL SENSOR
DEW SENSOR
G N D
EP SW
FUL END SW
FL END SW
TAPE END S
TAPE TOP S
TO MECHANISM
CN3558
CN3003
D.O.P
PB H
REC
A.MUTE
POWER UP
INDEX.AD.MUTE
TO VD-1
CN2003
ALWAYS 5V
ALWAYS 13V
GND
GND(MOTOR)
REC
POWER UP
F.ADV.P
MH-ON
MC-ON
MC-BR
SEARCH
SP/LP SW
MC-F/R
REC INDEX
A.MUTE
INDEX AD MUTE
SV D3
SV D2
SV D1
SV D0
INDEX1
CTL-MUTE
CTL-P
SP/LP
C.FG.P
RF.SW.P
CN3002(WHITE)
S.CLK
S.IN
S.OUT
TO TM-4
CN7403
Q3001
2SC536E,F
RESET
Q3002
2SC536F
SWITCH
Q3003
2SC536E,F
RESET
Q3004
2SC536E,F
SWITCH
Q3005
2SA984
SWITCH
B3002
2SC3399
SWITCH
R3001
2SC3399
SWITCH
X3001
CSA8.00MT
X3002
CSA5.00MT

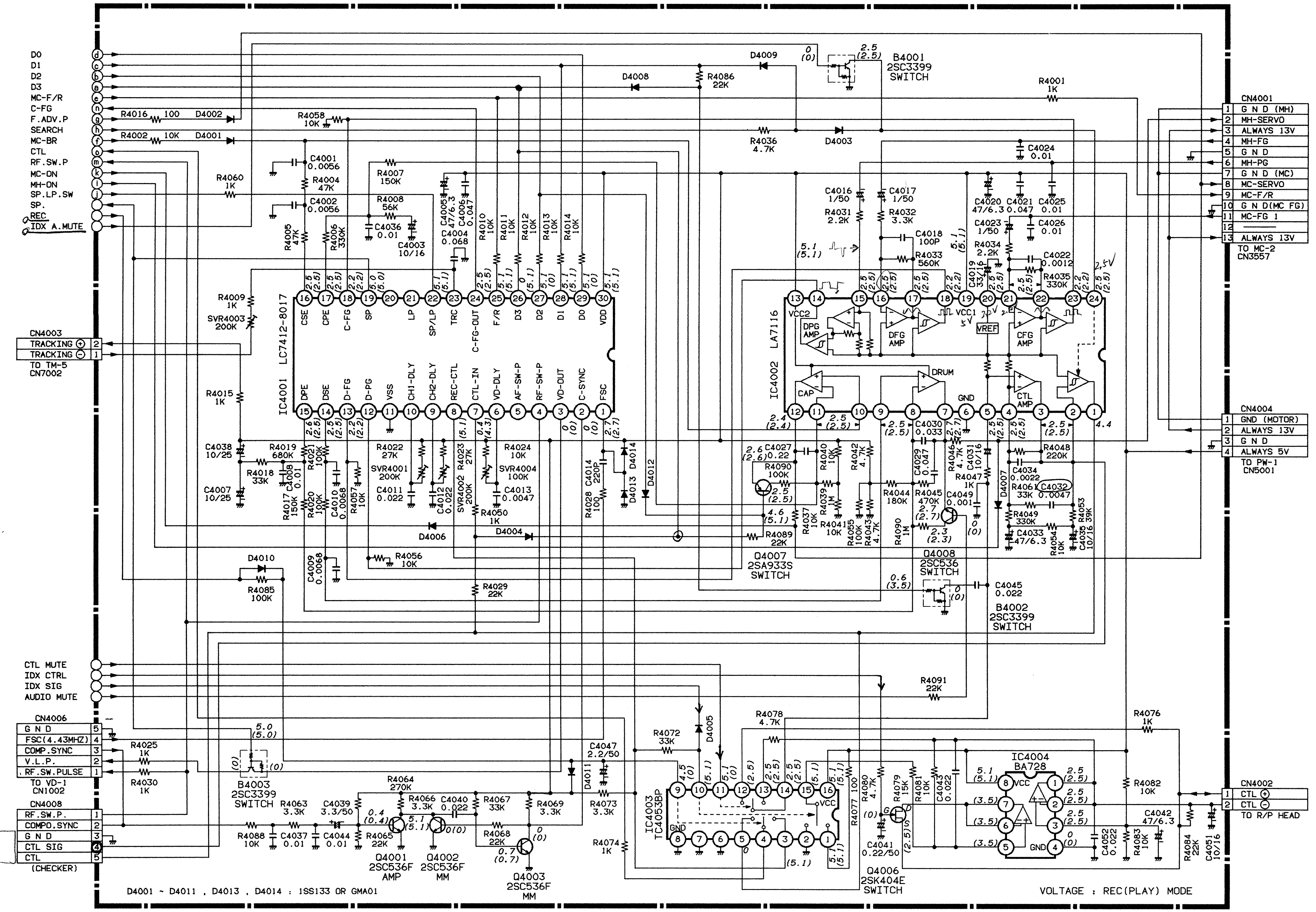
SERVO INTERFACE

| MODE | D3 | D2 | D1 | D0 | HEX | MODE | D3 | D2 | D1 | D0 | HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STOP | 0 | 0 | 0 | 0 | 0 | PAUSE | 1 | 0 | 0 | 0 | 8 |
| FL FUL | 0 | 0 | 0 | 1 | 1 | NEARIY MODE | 1 | 0 | 0 | 1 | 9 |
| TL | 0 | 0 | 1 | 0 | 2 | PLAY-A | 1 | 0 | 1 | 0 | A |
| FF REW | 0 | 0 | 1 | 1 | 3 | X2S | 1 | 0 | 1 | 1 | B |
| TL | 0 | 1 | 0 | 0 | 4 | ——— | 1 | 1 | 0 | 0 | C |
| TUL | 0 | 1 | 0 | 1 | 5 | CUE RVW | 1 | 1 | 0 | 1 | D |
| MODE CHANGE | 0 | 1 | 1 | 0 | 6 | STILL | 1 | 1 | 1 | 0 | E |
| REC | 0 | 1 | 1 | 1 | 7 | SLOW | 1 | 1 | 1 | 1 | F |

MECHANISM SWITCH

|  | SW DATA2 | SW DATA1 | SW DATA0 | HEX |
|---|---|---|---|---|
| EJECT POS | 0 | 0 | 1 | 1 |
| FL POS | 1 | 1 | 1 | 7 |
| FF/REW POS | 0 | 1 | 0 | 2 |
| STOP POS | 0 | 1 | 1 | 3 |
| PLAY POS | 1 | 0 | 0 | 4 |
| STILL POS | 1 | 0 | 1 | 5 |
| RVW POS | 1 | 1 | 0 | 6 |

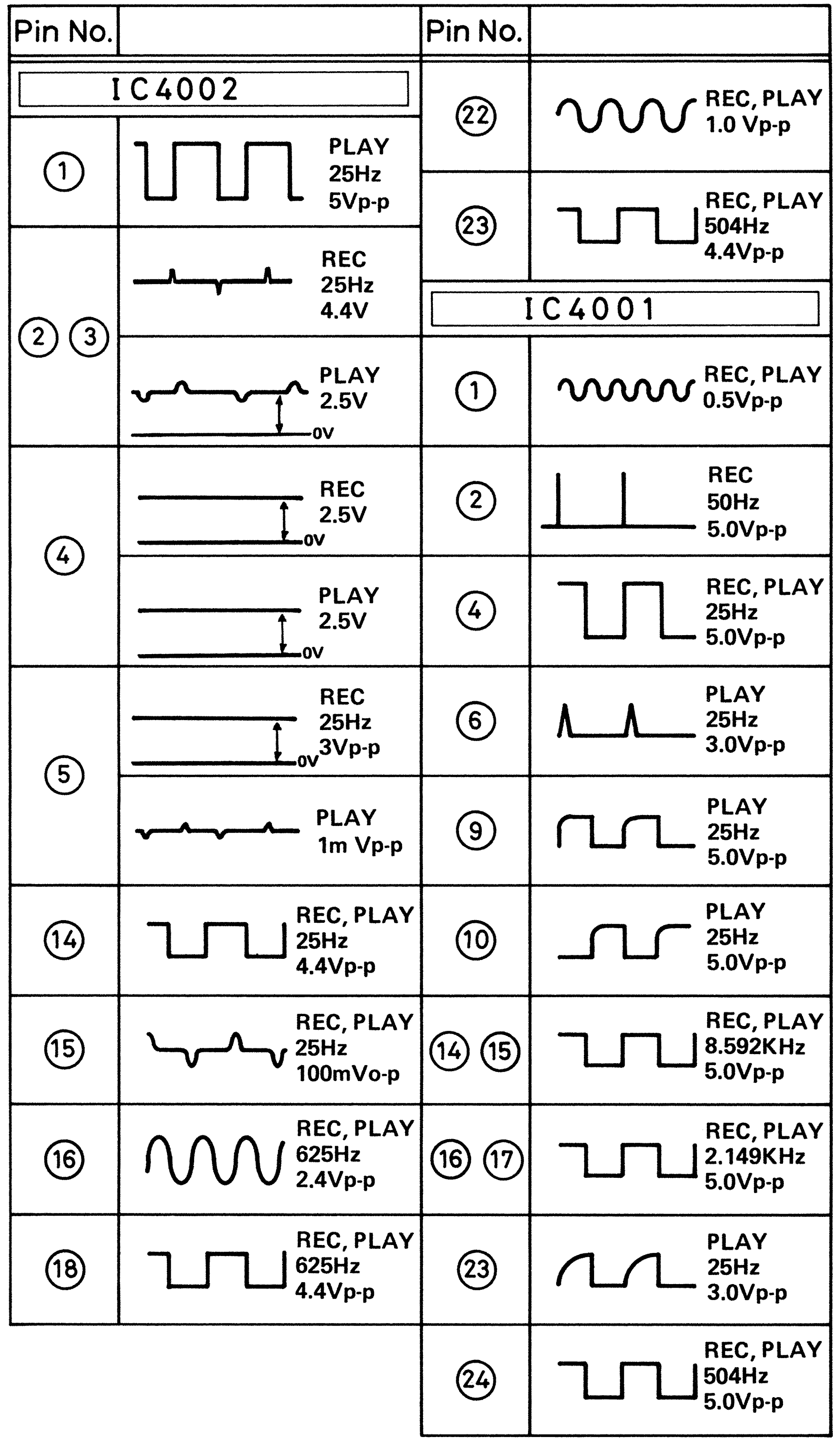
# P.C.B. SY-1 SERVO CIRCUIT (143-0-233V-46700)


D0
D1
D2
D3
MC-F/R
C-FG
F.ADV.P
SEARCH
MC-BR
CTL
RF.SW.P
MC-ON
MH-ON
SP.LP.SW
SP.
REC
IDX A.MUTE
CN4003
TRACKING ⊕
TRACKING ⊖
TO TM-5 CN7002
CTL MUTE
IDX CTRL
IDX SIG
AUDIO MUTE
CN4006
GND
FSC(4.43MHZ)
COMP.SYNC
V.L.P.
RF.SW.PULSE
TO VD-1 CN1002
CN4008
RF.SW.P.
COMPO.SYNC
GND
CTL SIG
CTL
(CHECKER)
IC4001 LC7412-8017
IC4002 LA7116
IC4003 TC4053BP
IC4004 BA728
B4001 2SC3399 SWITCH
B4002 2SC3399 SWITCH
B4003 2SC3399 SWITCH
Q4001 2SC536F AMP
Q4002 2SC536F MM
Q4003 2SC536F MM
Q4006 2SK404E SWITCH
Q4007 2SA933S SWITCH
Q4008 2SC536 SWITCH
DFG AMP
DPG AMP
CFG AMP
CTL AMP
CAP
DRUM
VREF
CN4001
G N D (MH)
MH-SERVO
ALWAYS 13V
MH-FG
G N D
MH-PG
G N D (MC)
MC-SERVO
MC-F/R
G N D(MC FG)
MC-FG 1
ALWAYS 13V
TO MC-2 CN3557
CN4004
GND (MOTOR)
ALWAYS 13V
G N D
ALWAYS 5V
TO PW-1 CN5001
CN4002
CTL ⊕
CTL ⊖
TO R/P HEAD

D4001 ~ D4011 , D4013 , D4014 : 1SS133 OR GMA01

VOLTAGE : REC(PLAY) MODE

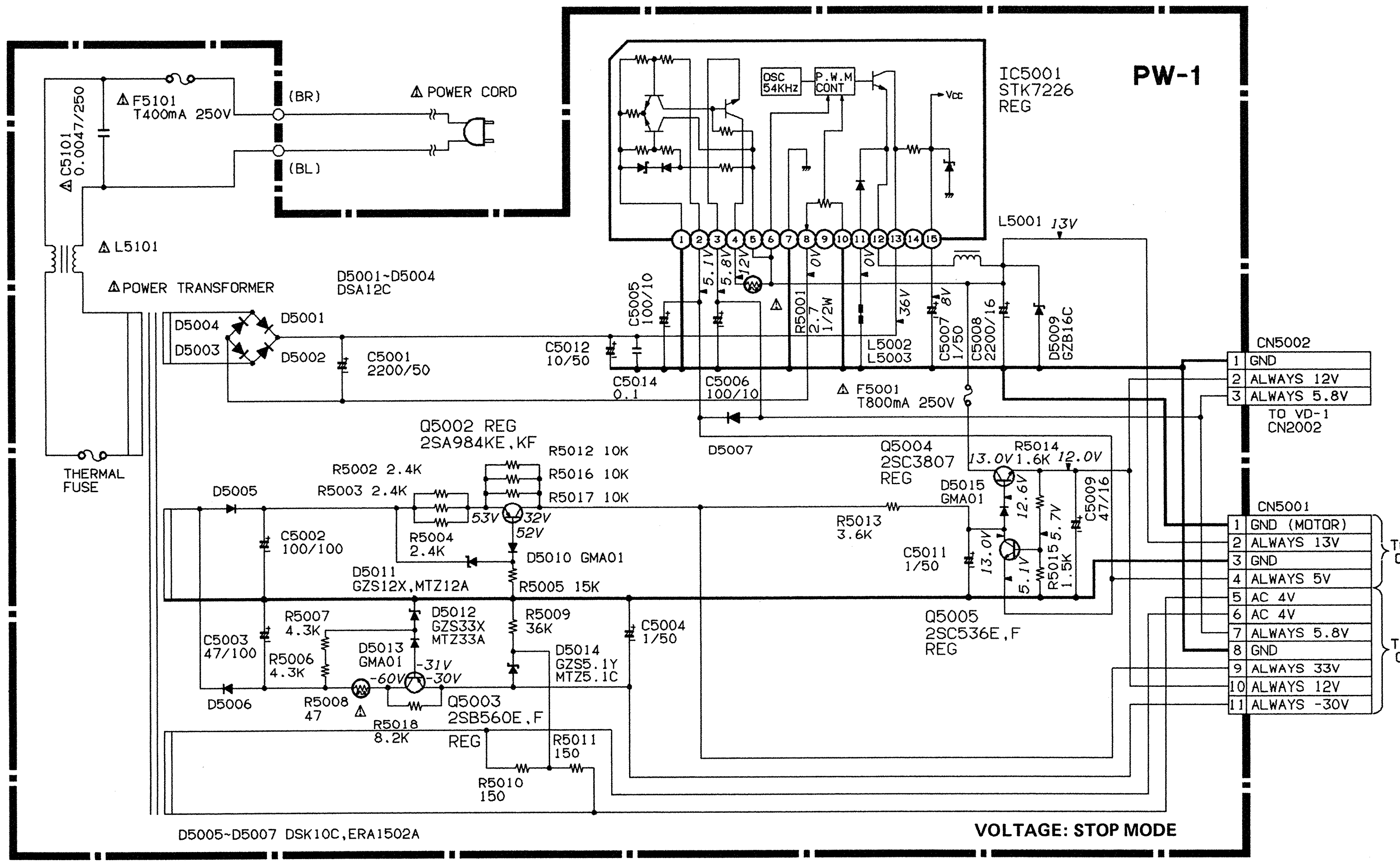
## WAVEFORM OF SERVO



| Pin No. | |
|---|---|
| IC4002 | |
| ① | PLAY 25Hz 5Vp-p |
| ② ③ | REC 25Hz 4.4V |
| | PLAY 2.5V 0V |
| ④ | REC 2.5V 0V |
| | PLAY 2.5V 0V |
| ⑤ | REC 25Hz 3Vp-p 0V |
| | PLAY 1m Vp-p |
| ⑭ | REC, PLAY 25Hz 4.4Vp-p |
| ⑮ | REC, PLAY 25Hz 100mVo-p |
| ⑯ | REC, PLAY 625Hz 2.4Vp-p |
| ⑱ | REC, PLAY 625Hz 4.4Vp-p |
| ㉒ | REC, PLAY 1.0 Vp-p |
| ㉓ | REC, PLAY 504Hz 4.4Vp-p |
| IC4001 | |
| ① | REC, PLAY 0.5Vp-p |
| ② | REC 50Hz 5.0Vp-p |
| ④ | REC, PLAY 25Hz 5.0Vp-p |
| ⑥ | PLAY 25Hz 3.0Vp-p |
| ⑨ | PLAY 25Hz 5.0Vp-p |
| ⑩ | PLAY 25Hz 5.0Vp-p |
| ⑭ ⑮ | REC, PLAY 8.592KHz 5.0Vp-p |
| ⑯ ⑰ | REC, PLAY 2.149KHz 5.0Vp-p |
| ㉓ | PLAY 25Hz 3.0Vp-p |
| ㉔ | REC, PLAY 504Hz 5.0Vp-p |

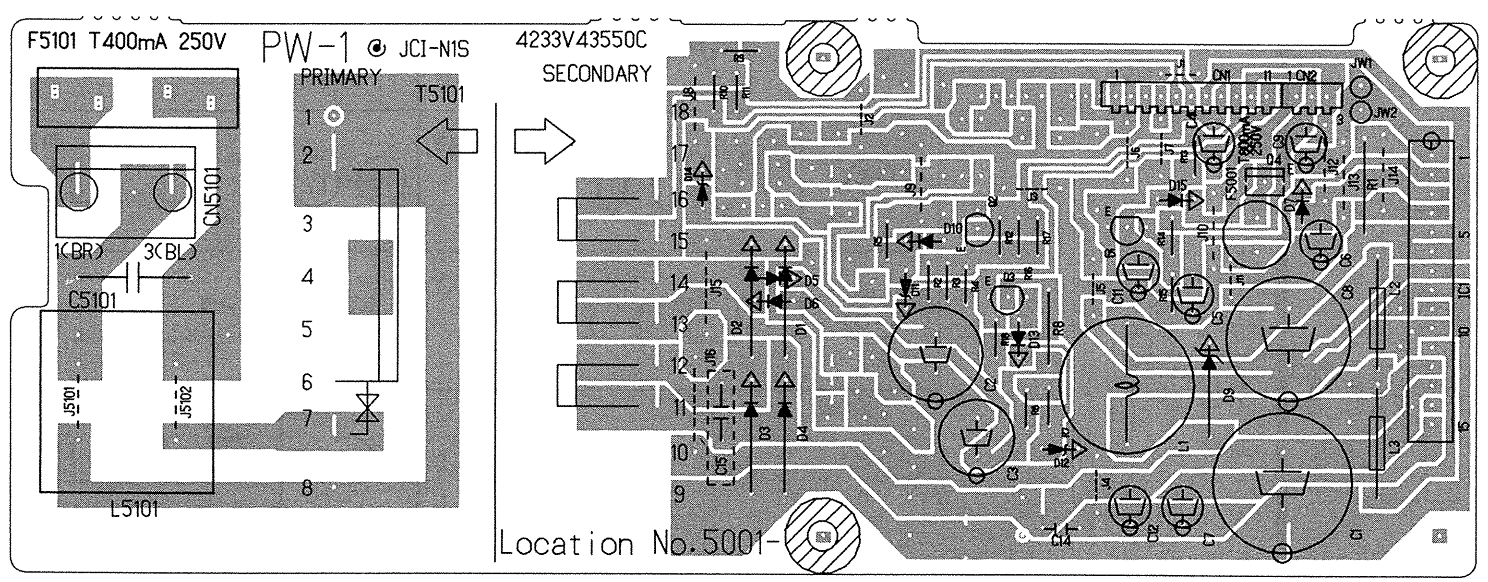
Ⓖ VHR-3300E

### P.C.B. PW-1 POWER SUPPLY CIRCUIT & P.C.B. (143-0-233V-43575)



PW-1
IC5001
STK7226
REG
OSC
54KHz
P.W.M
CONT
Vcc
⚠F5101
T400mA 250V
(BR)
(BL)
⚠POWER CORD
⚠C5101
0.0047/250
⚠L5101
⚠POWER TRANSFORMER
THERMAL
FUSE
D5001-D5004
DSA12C
D5004
D5001
D5003
D5002
C5001
2200/50
C5012
10/50
C5005
100/10
C5014
0.1
C5006
100/10
R5001
2.2
1/2W
L5002
L5003
⚠F5001
T800mA 250V
C5007
1/50
C5008
2200/16
D5009
GZB16C
L5001 13V
5.1V
5.8V
12V
0V
0V
36V
8V
D5007
CN5002
1 GND
2 ALWAYS 12V
3 ALWAYS 5.8V
TO VD-1
CN2002
Q5002 REG
2SA984KE,KF
R5012 10K
R5016 10K
R5017 10K
R5002 2.4K
R5003 2.4K
53V
32V
52V
R5004
2.4K
D5005
C5002
100/100
D5010 GMA01
D5011
GZS12X,MTZ12A
R5005 15K
Q5004
2SC3807
REG
R5014
1.6K
13.0V
12.0V
D5015
GMA01
R5013
3.6K
C5011
1/50
12.6V
5.7V
13.0V
5.1V
R5015
1.5K
C5009
47/16
Q5005
2SC536E,F
REG
CN5001
1 GND (MOTOR)
2 ALWAYS 13V
3 GND
4 ALWAYS 5V
5 AC 4V
6 AC 4V
7 ALWAYS 5.8V
8 GND
9 ALWAYS 33V
10 ALWAYS 12V
11 ALWAYS -30V
TO SY-1
CN4004
TO TM-4
CN7401
C5003
47/100
R5007
4.3K
R5006
4.3K
D5012
GZS33X
MTZ33A
R5009
36K
C5004
1/50
D5013
GMA01
-31V
-60V
-30V
D5014
GZS5.1Y
MTZ5.1C
D5006
R5008
47
Q5003
2SB560E,F
REG
R5018
8.2K
R5011
150
R5010
150
D5005~D5007 DSK10C,ERA1502A

VOLTAGE: STOP MODE

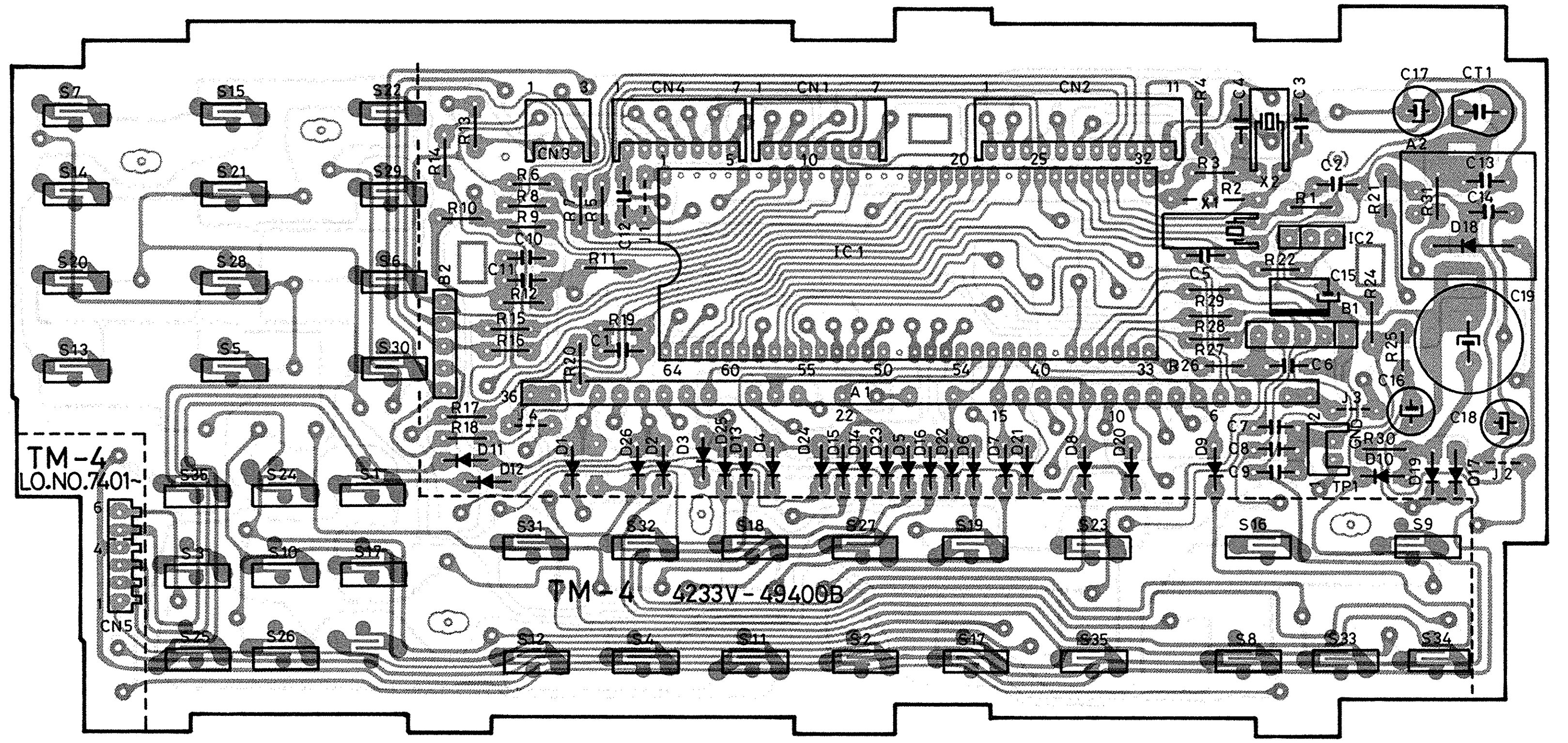


F5101 T400mA 250V
PW-1
JCI-N1S
4233V43550C
PRIMARY
SECONDARY
T5101
CN5101
1(BR)
3(BL)
C5101
L5101
J501
J502
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

Location No.5001-

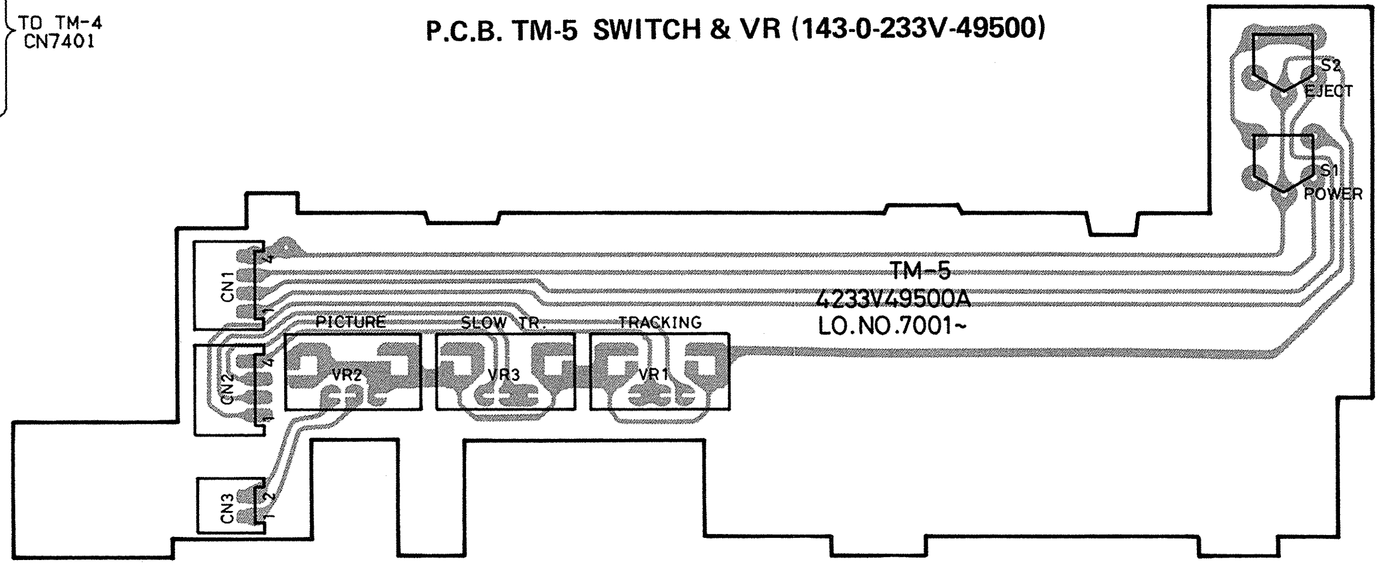
**VHR-3300E**

### P.C.B. TM-4 DISPLAY & TIMER (143-0-233V-49421)



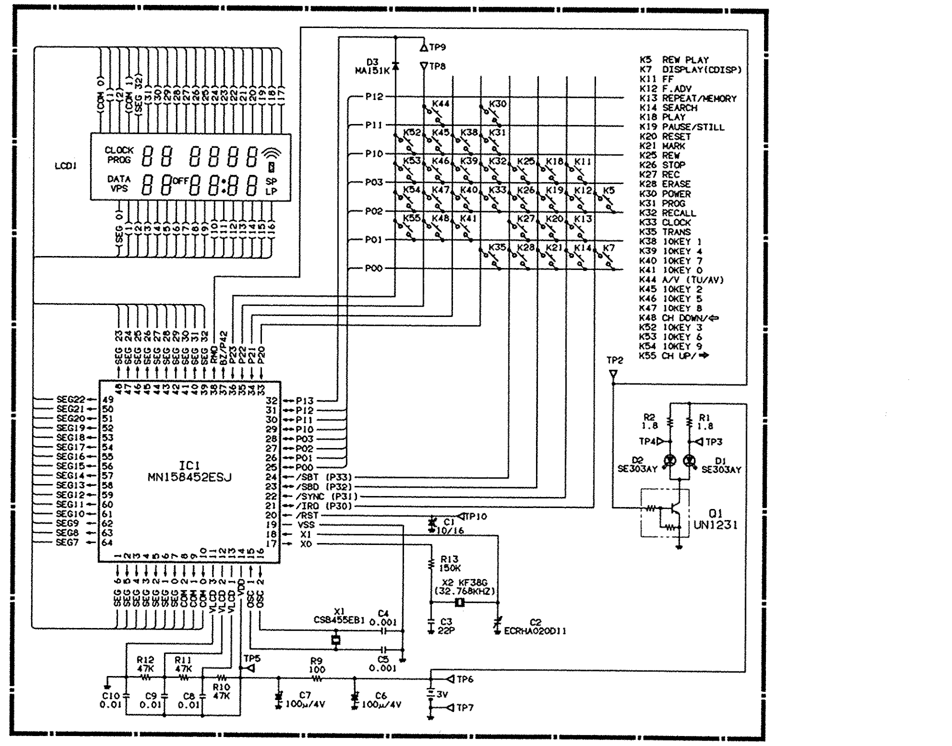
TM-4
LO.NO.7401-
TM-4
4233V-49400B
IC1
IC2
CN1
CN2
CN3
CN4
CN5
S7
S15
S22
S14
S21
S19
S20
S28
S6
S13
S5
S30
S25
S24
S1
S3
S10
S11
S31
S32
S18
S27
S39
S23
S16
S9
S29
S26
S12
S4
S17
S2
S8
S33
S34
S35
C17
CT1
C19
C18
C16
X1
X2

### P.C.B. TM-5 SWITCH & VR (143-0-233V-49500)



S2
EJECT
S1
POWER
TM-5
4233V49500A
LO.NO.7001~
CN1
CN2
CN3
PICTURE
SLOW TR.
TRACKING
VR2
VR3
VR1

### IR REMOTE CONTROL CIRCUIT (143-9-4100-68080)

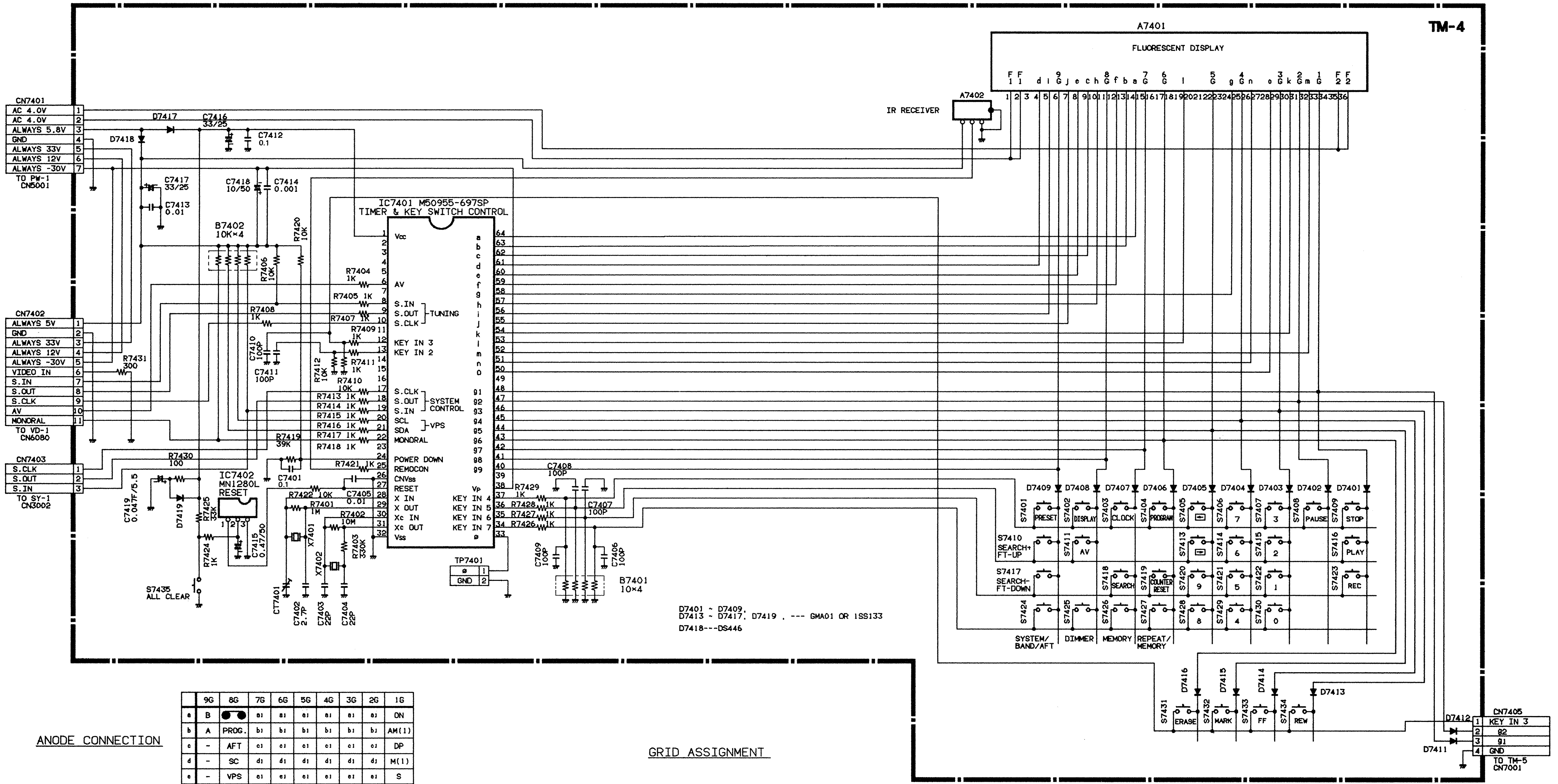


LCD1
IC1
MN158452ESJ
X1
CSB455E
X2
KF38G
(32.768KHz)
Q1
UN1231
D1
SE303AY
D2
SE303AY
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
D3
MA151K
K5 REW PLAY
K7 DISPLAY(DISP)
K11 FF
K12 F.ADV
K13 REPEAT/MEMORY
K14 SEARCH
K18 PLAY
K19 PAUSE/STILL
K20 RESET
K21 MARK
K25 REW
K26 STOP
K27 REC
K28 ERASE
K30 POWER
K31 PROG
K32 RECALL
K33 CLOCK
K35 TRANS
K36 10KEY 1
K39 10KEY 4
K40 10KEY 0
K41 10KEY 2
K44 A/V (TU/AV)
K45 10KEY 3
K46 10KEY 5
K47 10KEY 6
K48 CH DOWN/
K52 10KEY 7
K53 10KEY 8
K54 10KEY 9
K55 CH UP/
C7
100μ/4V
C6
100μ/4V
3V

K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

## P.C.B. TM-4 DISPLAY & TIMER CIRCUIT (143-0-233V-49421)

## P.C.B. TM-5 SWITCH & VR CIRCUIT (143-0-233V-49500)

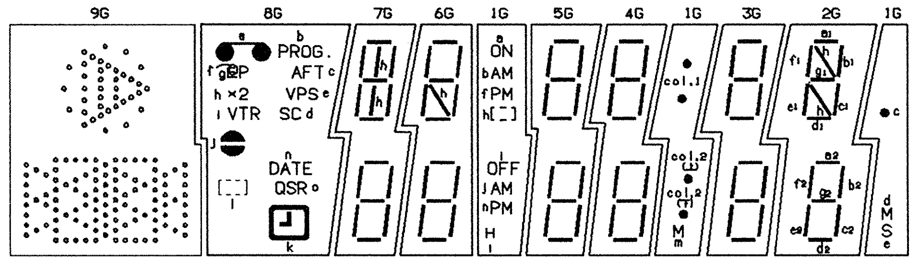

TM-4
A7401
FLUORESCENT DISPLAY
A7402
IR RECEIVER
CN7401
AC 4.0V
AC 4.0V
ALWAYS 5.8V
GND
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
TO PW-1 CN5001
CN7402
ALWAYS 5V
GND
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
VIDEO IN
S.IN
S.OUT
S.CLK
AV
MONORAL
TO VD-1 CN6080
CN7403
S.CLK
S.OUT
S.IN
TO SY-1 CN3002
D7417
C7416 33/25
C7412 0.1
D7418
C7417 33/25
C7413 0.01
C7418 10/50
C7414 0.001
B7402 10K×4
R7420 10K
R7406 10K
IC7401 M50955-697SP
TIMER & KEY SWITCH CONTROL
Vcc
AV
S.IN
S.OUT
S.CLK
TUNING
KEY IN 3
KEY IN 2
SYSTEM CONTROL
SCL
SDA
VPS
MONORAL
POWER DOWN
REMOCON
CNVss
RESET
X IN
X OUT
Xc IN
Xc OUT
Vss
Vp
KEY IN 4
KEY IN 5
KEY IN 6
KEY IN 7
R7404 1K
R7405 1K
R7407 1K
R7408 1K
R7409 1K
R7410 10K
R7411 1K
R7412 10K
R7413 1K
R7414 1K
R7415 1K
R7416 1K
R7417 1K
R7418 1K
R7419 39K
R7421 1K
R7422 10K
R7401 1M
R7402 10M
R7403 330K
C7410 100P
C7411 100P
C7401 0.1
C7405 0.01
R7431 300
R7430 100
C7419 0.047F/5.5
D7419
R7425 33K
R7424 1K
IC7402 MN1280L RESET
C7415 0.47/50
S7435 ALL CLEAR
X7401
X7402
CT7401
C7402 2.7P
C7403 22P
C7404 22P
TP7401
GND
R7429 1K
R7428 1K
R7427 1K
R7426 1K
C7408 100P
C7407 100P
C7409 100P
C7406 100P
B7401 10×4
D7401 ~ D7409, D7413 ~ D7417, D7419 , --- GMA01 OR 1SS133
D7418---DS446
D7401
D7402
D7403
D7404
D7405
D7406
D7407
D7408
D7409
S7401 PRESET
S7402 DISPLAY
S7403 CLOCK
S7404 PROGRAM
S7405
S7406 7
S7407 3
S7408 PAUSE
S7409 STOP
S7410 SEARCH+ FT-UP
S7411 AV
S7413
S7414 6
S7415 2
S7416 PLAY
S7417 SEARCH- FT-DOWN
S7418 SEARCH
S7419 COUNTER RESET
S7420 9
S7421 5
S7422 1
S7423 REC
S7424 SYSTEM/ BAND/AFT
S7425 DIMMER
S7426 MEMORY
S7427 REPEAT/ MEMORY
S7428 8
S7429 4
S7430 0
D7416
D7415
D7414
D7413
S7431 ERASE
S7432 MARK
S7433 FF
S7434 REW
D7412
D7411
CN7405
KEY IN 3
g2
g1
GND
TO TM-5 CN7001

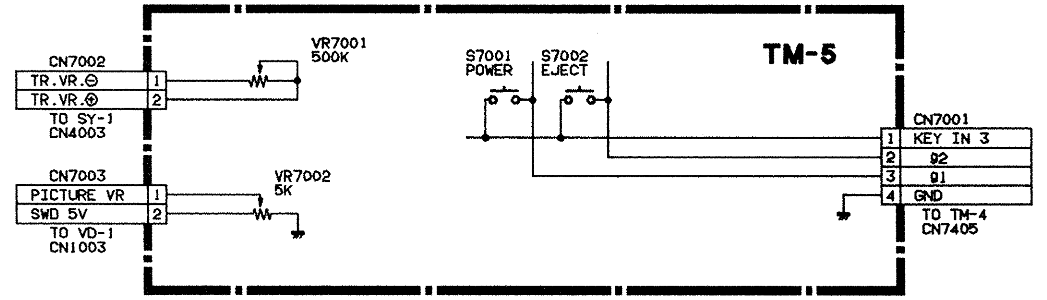
❶
VHR-3300E

ANODE CONNECTION

| | 9G | 8G | 7G | 6G | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|---|---|---|---|
| a | B | ●━● | a1 | a1 | a1 | a1 | a1 | a1 | ON |
| b | A | PROG. | b1 | b1 | b1 | b1 | b1 | b1 | AM(1) |
| c | – | AFT | c1 | c1 | c1 | c1 | c1 | c1 | DP |
| d | – | SC | d1 | d1 | d1 | d1 | d1 | d1 | M(1) |
| e | – | VPS | e1 | e1 | e1 | e1 | e1 | e1 | S |
| f | C | ≡P | f1 | f1 | f1 | f1 | f1 | f1 | PM(1) |
| g | D | EP | g1 | g1 | g1 | g1 | g1 | g1 | col.1 |
| h | – | ×2 | / | \ | - | - | - | \ | ⬚ |
| i | – | VTR | a2 | a2 | a2 | a2 | a2 | a2 | OFF |
| j | E | ⊖ | b2 | b2 | b2 | b2 | b2 | b2 | AM(2) |
| k | I | ▣ | c2 | c2 | c2 | c2 | c2 | c2 | col.2(T) |
| l | H | ⬚ | d2 | d2 | d2 | d2 | d2 | d2 | H |
| m | J | – | e2 | e2 | e2 | e2 | e2 | e2 | M(2) |
| n | F | DATE | f2 | f2 | f2 | f2 | f2 | f2 | PM(2) |
| o | G | QSR | g2 | g2 | g2 | g2 | g2 | g2 | col.2(⊥) |

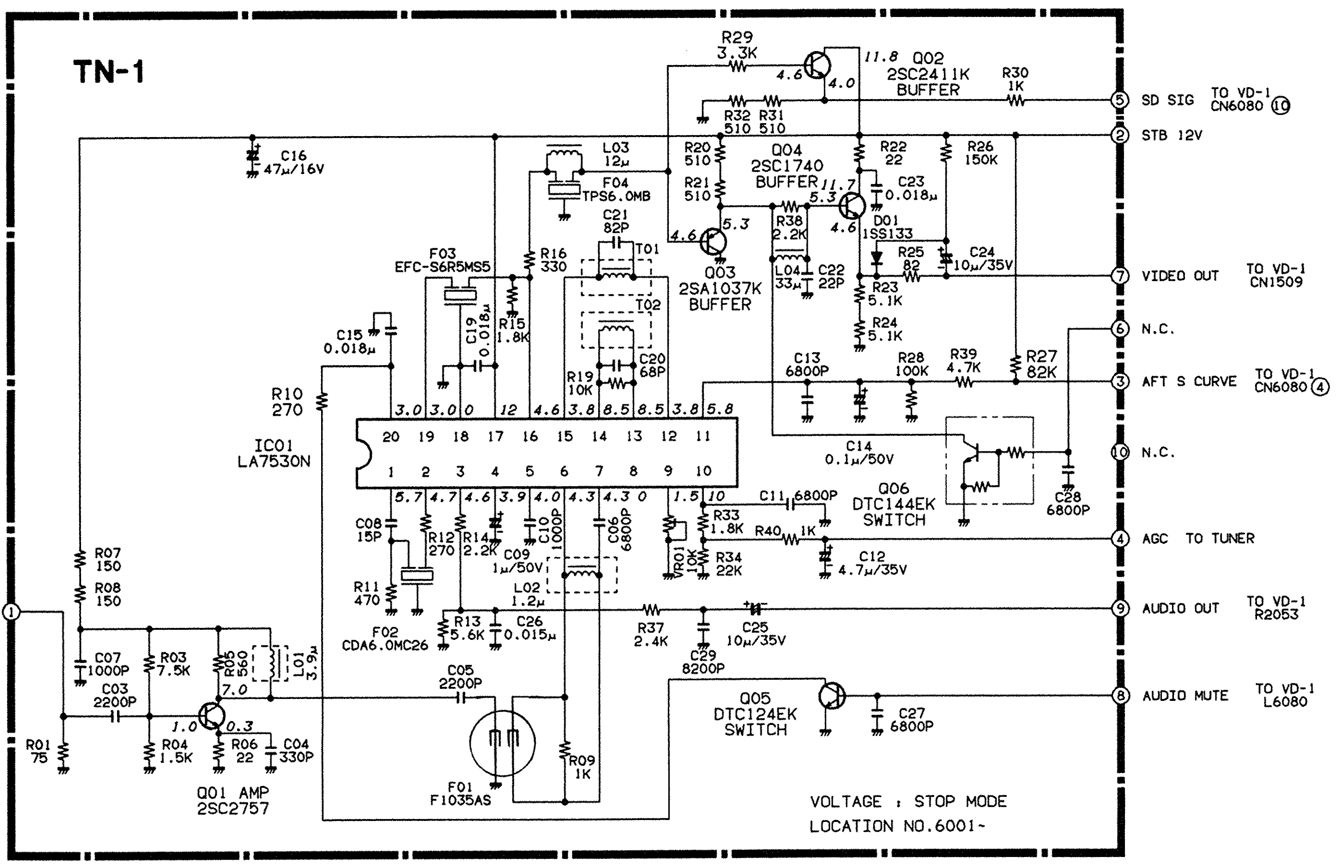
GRID ASSIGNMENT

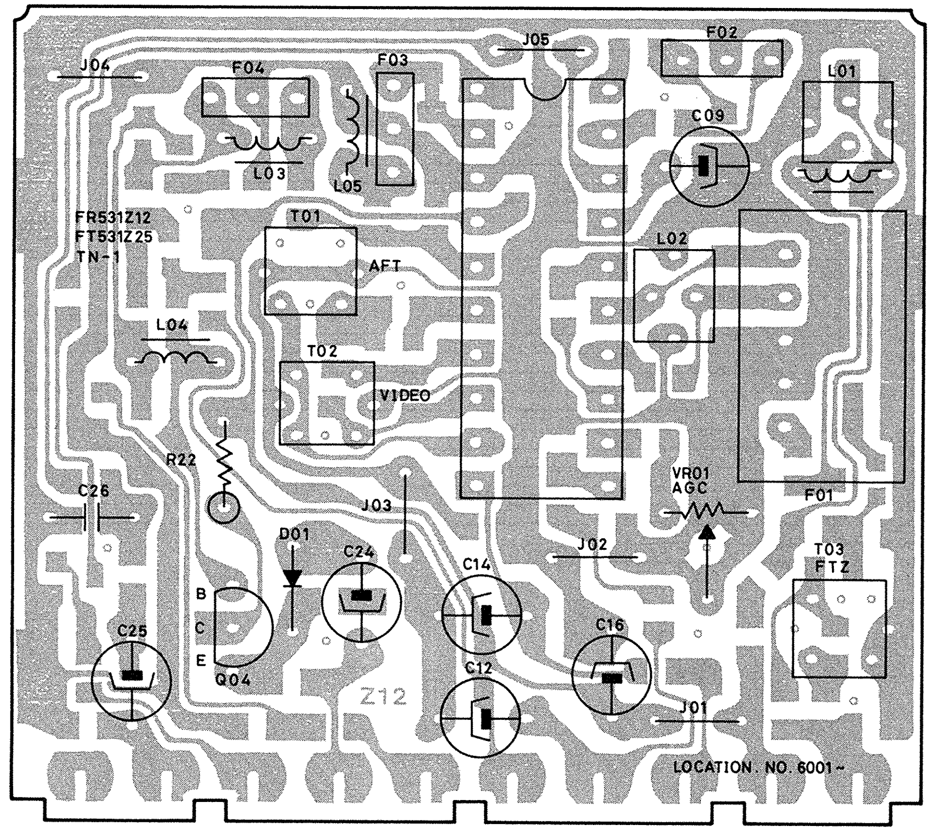

9G
8G
7G
6G
1G
5G
4G
1G
3G
2G
1G
PROG.
AFT
VPS
SC
VTR
×2
DATE
QSR
ON
AM
PM
OFF
AM
PM
H
col.1
col.2
M


TM-5
CN7002
TR.VR.⊖
TR.VR.⊕
TO SY-1 CN4003
VR7001 500K
CN7003
PICTURE VR
SWD 5V
TO VD-1 CN1003
VR7002 5K
S7001 POWER
S7002 EJECT
CN7001
KEY IN 3
g2
g1
GND
TO TM-4 CN7405

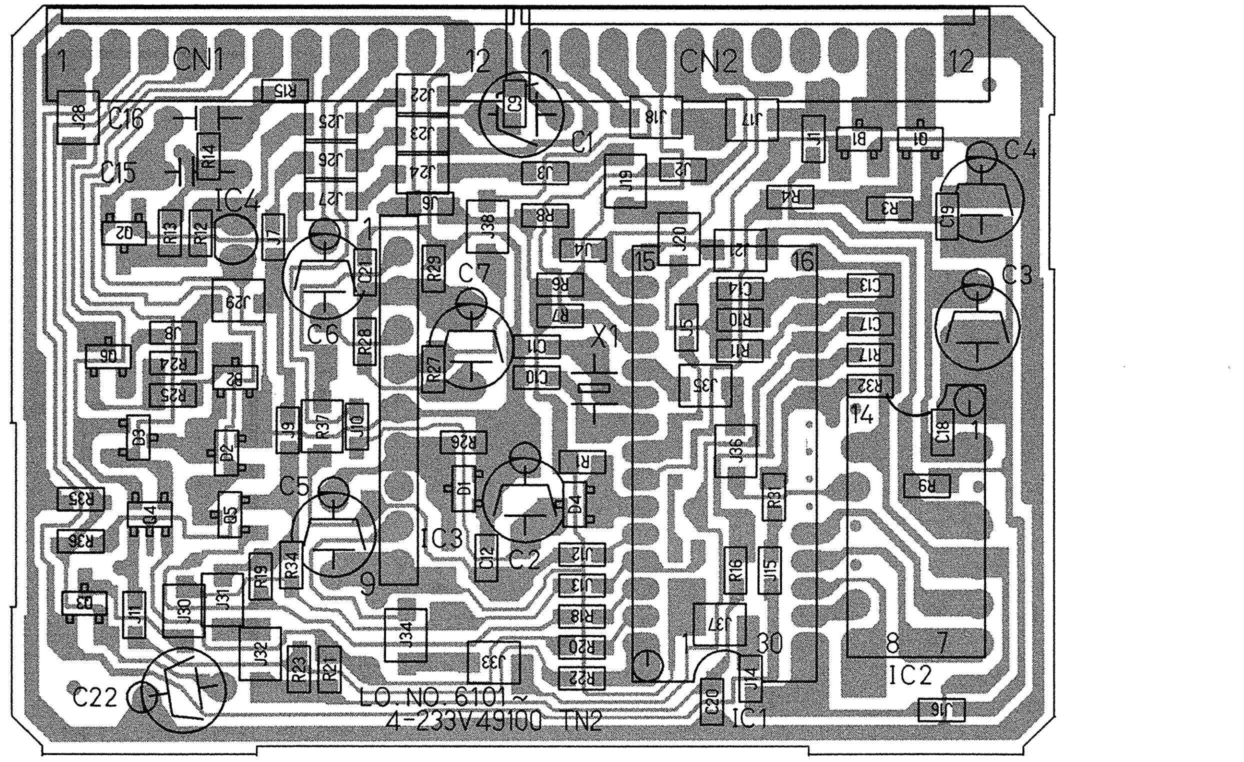
## P.C.B. TN-1 TUNER IF CIRCUIT & P.C.B. (143-9-4300-83100)

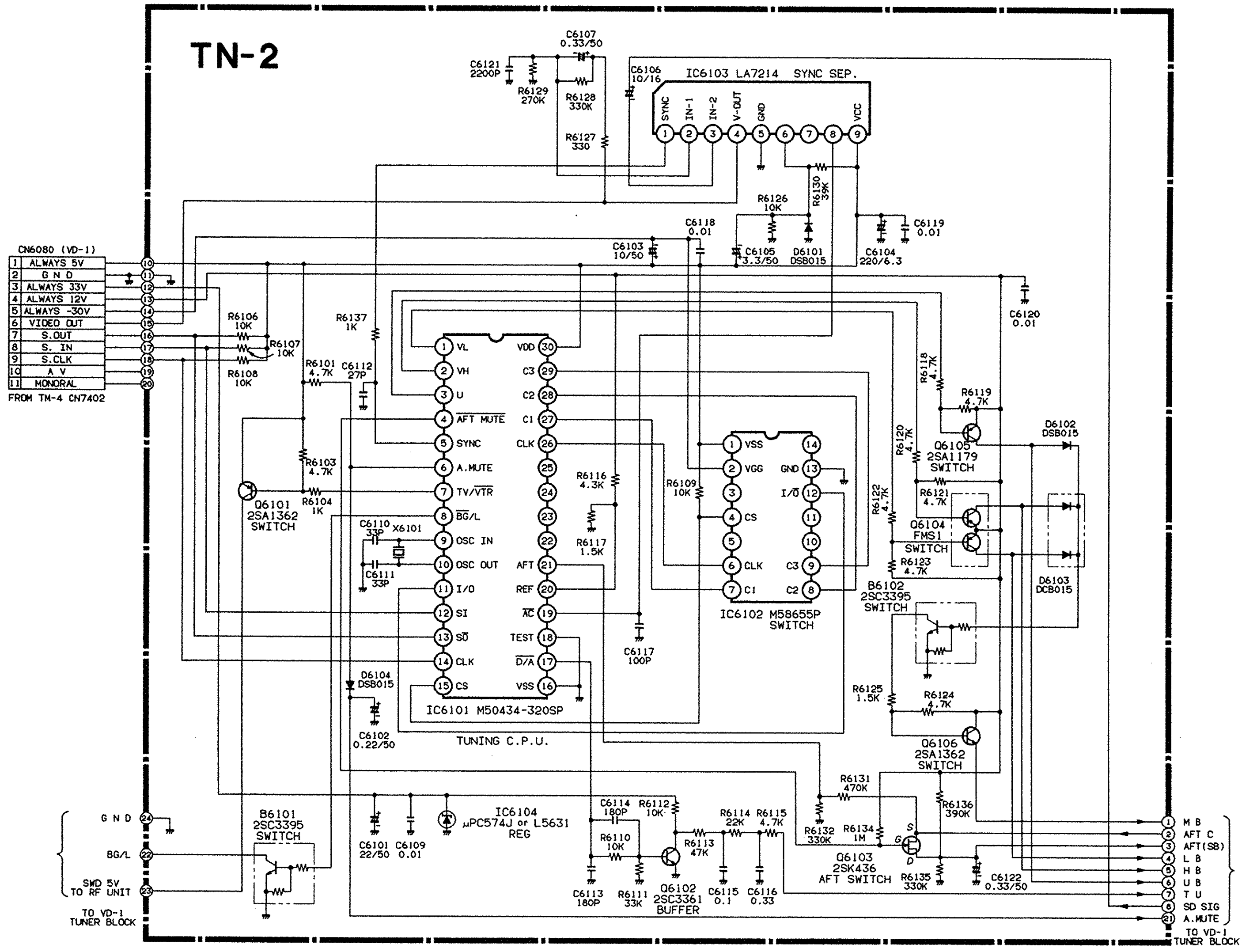
**VHR-3300E**


TN-1
IC01 LA7530N
Q01 AMP 2SC2757
Q02 2SC2411K BUFFER
Q03 2SA1037K BUFFER
Q04 2SC1740 BUFFER
Q05 DTC124EK SWITCH
Q06 DTC144EK SWITCH
F01 F1035AS
F02 CDA6.0MC26
F03 EFC-S6R5MS5
F04 TPS6.0MB
IF TO TUNER
SD SIG TO VD-1 CN6080 ⑩
STB 12V
VIDEO OUT TO VD-1 CN1509
N.C.
AFT S CURVE TO VD-1 CN6080 ④
AGC TO TUNER
AUDIO OUT TO VD-1 R2053
AUDIO MUTE TO VD-1 L6080
VOLTAGE : STOP MODE
LOCATION NO.6001~


FR531Z12
FT531Z25
TN-1
F04
F03
J05
F02
L01
J04
L03
L05
C09
T01
AFT
L02
T02
VIDEO
L04
R22
J03
VR01 AGC
F01
C26
D01
C24
C14
J02
T03 FTZ
B
C
E
C25
Q04
C16
C12
Z12
J01
LOCATION. NO. 6001~

## P.C.B. TN-2 TUNING CONTROL CIRCUIT & P.C.B. (143-0-233V-49127)


CN1
CN2
IC1
IC2
IC3
IC4
X1
C22
LO. NO. 6101~
4-233V49100 TN2


TN-2
IC6103 LA7214 SYNC SEP.
IC6101 M50434-320SP
TUNING C.P.U.
IC6102 M58655P SWITCH
IC6104 μPC574J or L5631 REG
Q6101 2SA1362 SWITCH
Q6102 2SC3361 BUFFER
Q6103 2SK436 AFT SWITCH
Q6104 FMS1 SWITCH
Q6105 2SA1179 SWITCH
Q6106 2SA1362 SWITCH
B6101 2SC3395 SWITCH
B6102 2SC3395 SWITCH
CN6080 (VD-1)
ALWAYS 5V
GND
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
VIDEO OUT
S.OUT
S.IN
S.CLK
A V
MONDRAL
FROM TN-4 CN7402
GND
BG/L
SWD 5V TO RF UNIT
TO VD-1 TUNER BLOCK
M B
AFT C
AFT(SB)
L B
H B
U B
T U
SD SIG
A.MUTE
TO VD-1 TUNER BLOCK

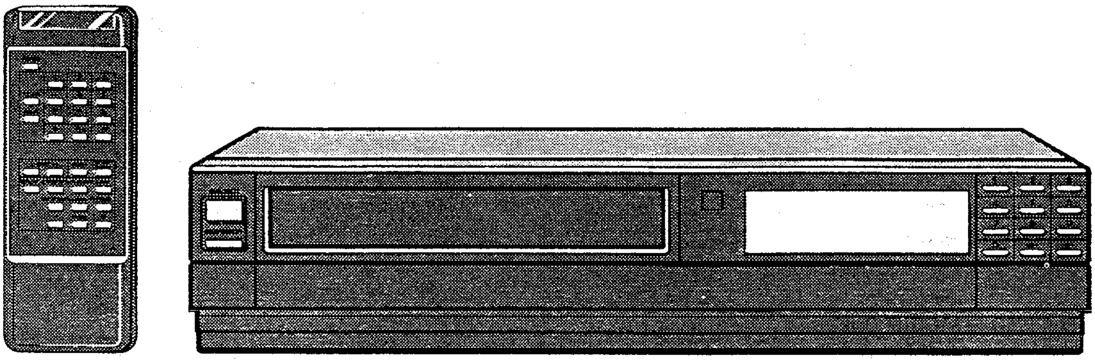
SERVICE MANUAL

SANYO

# VHR-3400I
# VHR-3500 Series

## COLOUR VIDEO CASSETTE RECORDER

VHS PAL HQ



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BP3 SERIES

REFERENCE NO. WM-20889

# 1. LOCATION OF THE MAIN BOARDS

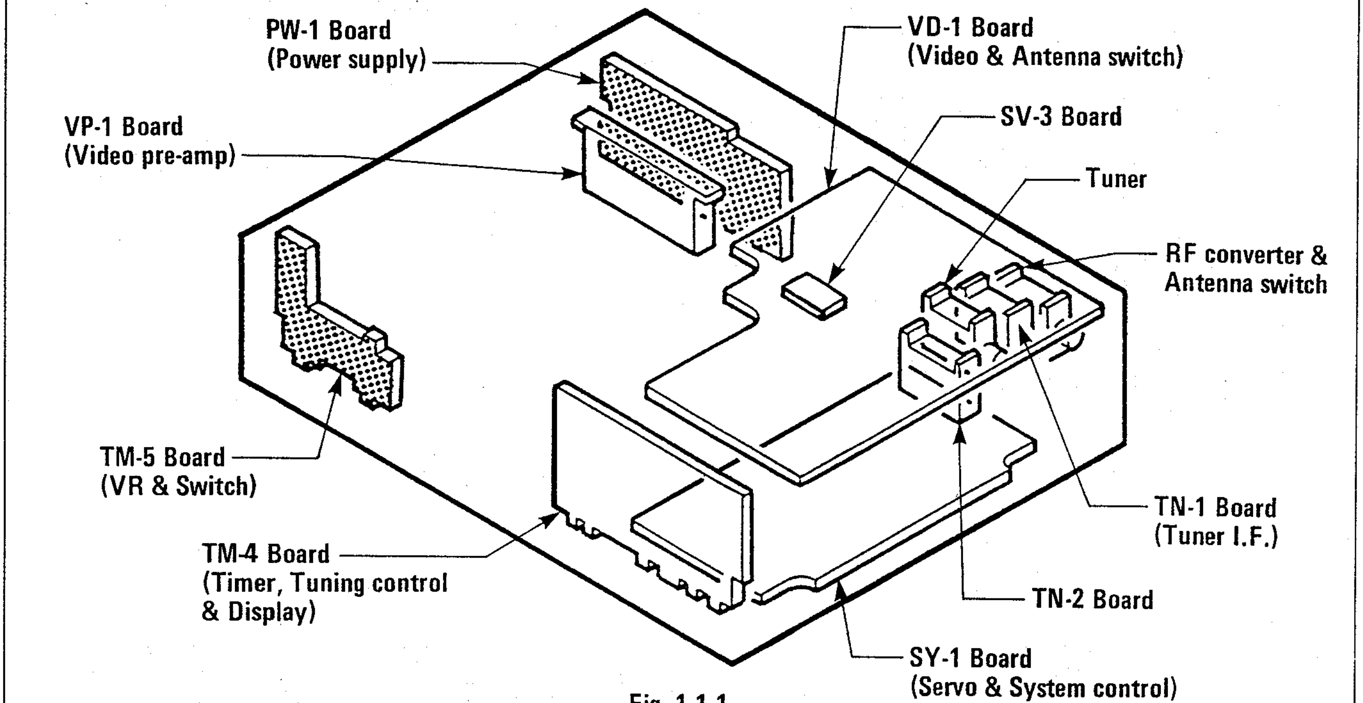

PW-1 Board
(Power supply)
VD-1 Board
(Video & Antenna switch)
VP-1 Board
(Video pre-amp)
SV-3 Board
Tuner
RF converter &
Antenna switch
TM-5 Board
(VR & Switch)
TN-1 Board
(Tuner I.F.)
TM-4 Board
(Timer, Tuning control
& Display)
TN-2 Board
SY-1 Board
(Servo & System control)

Fig. 1-1-1

# 2. ELECTRICAL ADJUSTMENTS

## 2-1. PREPARATIONS

### 2-1-1. EQUIPMENT

- Colour TV monitor
- Colour-bar generator (With RF and LINE OUTPUT)
- Audio frequency osillator
- Attenuator
- Oscilloscope (dual trace; frequency: 10 MHz or more; probe: 10:1)
- Frequency counter (countable to 10 MHz or higher)
- Digital voltmeter
- AC voltmeter
- IN/OUT probes
- Alignment cassette (VHJ-0008) Colour-bar 1 KHz
- Alignment cassette (VHJ-0009) Monoscope 6 KHz
- Alignment cassette (VHJ-0010) RF sweep
- Alignment cassette (VHJ-0023) PAL Monoscope 6 KHz, PAL Colour-bar 1 KHz, SECAM Colour-bar 1 KHz, PAL RF sweep, MESECAM Colour-bar 1 KHz, NTSC Colour-bar 1 KHz.

### 2-1-2. SET-UP

Because the RF input signal is used for adjustment of circuits, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfy the items shown in figure. Connect the oscilloscope to the VIDEO OUTPUT terminal of the video circuit, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3Vp-p.
- The amplitude of the video signal should be approximately 0.7Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.

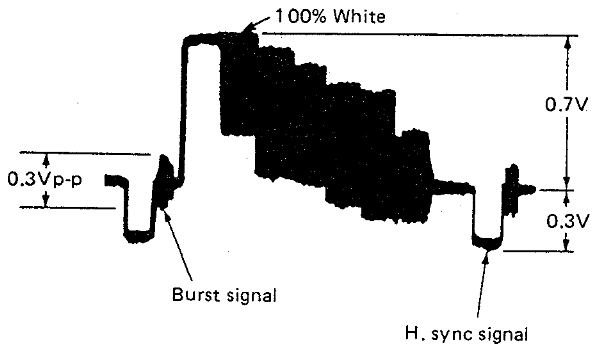
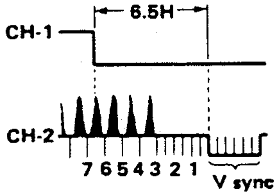
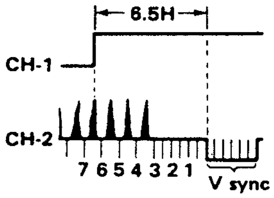
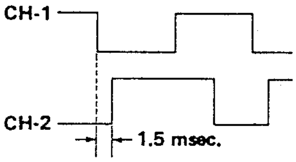
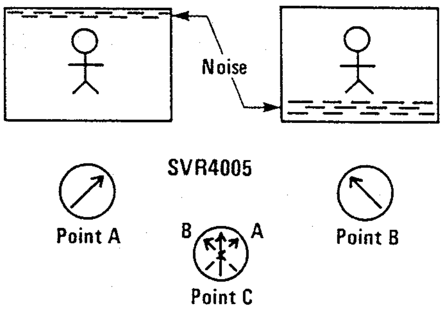
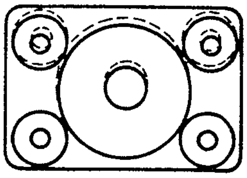


Fig. 2-1-1

## 2-2. SERVO CIRCUIT ADJUSTMENT ... SY-1 Board

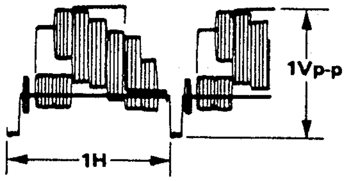
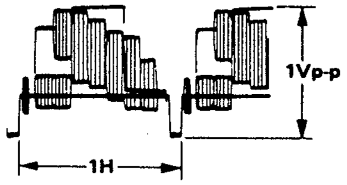
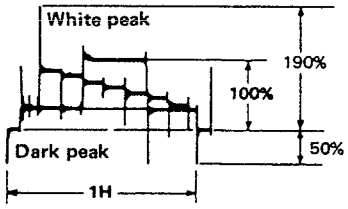
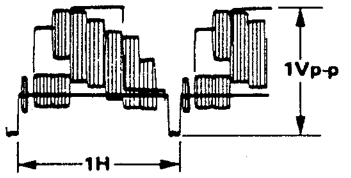
| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | CH-1 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4001 |  <br>Adjust SVR4001 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the fall of the CH-1 waveform. |
| 2 | CH-2 SWITCHING POSITION | Alignment cassette (VHJ-0009 or VHJ-0023) | PLAY | TP1001 (VIDEO OUT terminal)<br>CN4008 ① (trigger) | SVR4002 |  <br>Adjust SVR4002 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ±0.5H from the rise of the CH-1 waveform. |
| 3 | TRACKING | Colour bar from Colour bar generator | REC<br>↓<br>PLAY | CN4008 ④<br>CN4008 ① (trigger) | SVR4003 |  <br>1. Playback the recorded portion, and set the tracking control to the center click position.<br>2. Adjust SVR4003 so that the phase of the rise of the CH-2 waveform is 1.5 ±0.5msec after the fall of the CH-1 waveform. In this instance, delay the CH-2 waveform. |
| 4 | STILL V-LOCK | Colour bar from Colour bar generator | REC<br>↓<br>PLAY<br>↓<br>STILL | TV screen | VR4004 | 1. Playback the recorded portion and put the VCR in the STILL mode.<br>2. Adjust VR4004 so that the V jitter (very fine movement of the vertical sync) is minimized. |

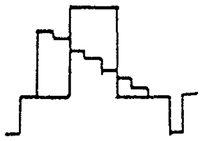
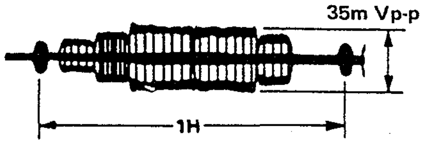
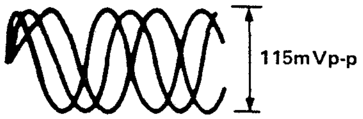
NOTE: Adjustment No.7 is unnecessary for VHR-3400I.

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 5 | SLOW TRACKING | Any TV broadcast | REC<br>⬇<br>PLAY<br>⬇<br>SLOW | TV screen | SVR4005 |  <br>1. Playback the recorded portion, and put the VCR in the SLOW mode.<br>2. Set the tracking control to the center position.<br>3. Observe the noise at the upper and Lower edges of the TV screen.<br>4. Turn SVR4005. The position of the SVR at which noise begins to appear at the upper edge of the TV screen is point A.<br>5. Turn SVR4005 once again. The position of the SVR at which noise begins to appear at the lower edge of the TV screen is point B.<br>6. Adjust SVR4005 to a point half way between point A and point B. This point is point C. |
| 6 | SLOW V JITTER | Any TV broadcast | REC<br>⬇<br>PLAY<br>⬇<br>SLOW | TV screen | SVR4007 | <br>TV screen<br>1. Playback the recorded portion, and put the VCR in the SLOW mode.<br>2. Adjust SVR4007 so that the V jitter (very fine movement of the vertical sync) is minimized. |
| 7 | X2 PLAYBACK | Any TV broadcast | REC<br>⬇<br>PLAY<br>⬇<br>X2 PLAY | TV screen | SVR4006 | 1. Set the tracking control to the center position.<br>2. Playback the recorded portion, and put the VCR in the X2 PLAY mode.<br>3. Observe the noise on the TV screen, and Adjust SVR4006 so that the noise disappears. |

## 2-3. VIDEO CIRCUIT ADJUSTMENT ... VD-1 Board

NOTE (1): When adjusting No. 1, No. 2 and No. 5 terminate VIDEO OUTPUT terminal (CN1021 pin ⑲ or RCA terminal) at 75 ohms.
(2): To make this adjustment, alternately make the adjustments described in No. 4 and No. 5 below. Repeat this procedure until both adjustment values are satisfied.
(3): No-signal E-E mode is do not supply any signal to VIDEO INPUT terminal. (CN1021 pin ⑳)

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | E-E LEVEL | Colour bar from Colour bar generator | E-E | TP1001 | SVR1007 |  <br>Adjust SVR1007 so that the level is 1.00 ±0.05 Vp-p. |
| 2 | PLAYBACK LEVEL | Alignment cassette (VHJ-0008 or VHJ-0023) | PLAY (Colour bar) | TP1001 | SVR1006 |  <br>Adjust SVR1006 so that the level is 1.00 ±0.05 Vp-p. |
| 3 | DARK CLIP AND WHITE CLIP | Colour bar from Colour bar generator | E-E | TP1002 (IC1101 ⑳ pin) | SVR1005 (DARK CLIP)<br>SVR1002 (WHITE CLIP) |  <br>1. Adjust SVR1005 so that the dark peak is 50 $^{+0}_{-5}$ %.<br>2. Adjust SVR1002 so that the white peak is 190 $^{+0}_{-5}$ %. |
| 4 | CARRIER SET | None NOTE (3) | E-E | TP1006 (CN1001) ⑥ | SVR1003 | 1. Set the TU/AV button to the AV position and put the VCR in the no-signal mode.<br>2. Adjust SVR1003 so that the frequency is 3.80 ±0.05 MHz. |
| 5 | DEVIATION | Colour bar from Colour bar generator | REC (Adjustment)<br>⬇<br>PLAY (Check) | TP1001 | SVR1004 |  <br>1. Playback the recorded part, and check that the level is 1.00 ±0.05Vp-p.<br>2. If the level is not 1.00 ±0.05Vp-p, adjust SVR1004, record and playback it until the value is satisfied. |

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 6 | VXO | Brank tape | PLAY | TP1007 | SVR1201 | Adjust SVR1201 so that the frequency is 4433619 ±20Hz. |
| 7 | CCD LEVEL | Colour bar from Colour bar generator | E-E | TP1003 (IC1101 ⑧pin)<br>TP1004 (IC1101 ⑨pin) | SVR1121 |  Adjust SVR1121 so that the same level of TP1003 and TP.1004 waveforms. |
| 8 | CHRO-MINANCE SIGNAL RECORDING CURRENT | Colour bar from Colour bar generator | REC | CN1603① (HOT)<br>CN1603③ (GND)<br>(See Fig. 2-1-4) | SVR1202 |  <br>1. Turn SVR1001 all the way to the right, looking from the parts side.<br>2. Adjust SVR1202 so that the level is 35 ±2 mVp-p. |
| 9 | LUMINANCE SIGNAL RECORDING CURRENT | B/W signal from Colour bar generator | REC | CN1603① (HOT)<br>CN1603③ (GND) | SVR1001 |  <br>Adjust SVR1001 so that the level is 115 ±5 mVp-p. |

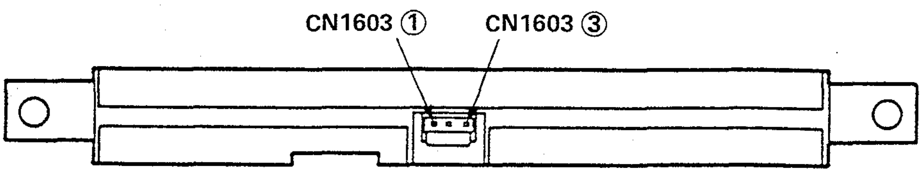


Fig. 2-1-4 VP-1 Board

## 2-4. TUNER IF CIRCUIT ADJUSTMENT

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | RF AGC | TV broadcast | E-E | TV screen | SVR6001 | Turn SVR6001 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears. |

## 2-5. AUDIO CIRCUIT ADJUSTMENT ... VD-1 Board

NOTE (1): No-signal record mode is do not supply any signal to the AUDIO INPUT terminal. (CN1021 pin ②⑥ or RCA terminal)
(2): Adjustment No.2 is unnecessary for VHR-3500 series.
(3): Adjustment No.3 is unnecessary for VHR-3400I.

| No. | Item | Input | Mode | Point | Location | Remark |
|---|---|---|---|---|---|---|
| 1 | BIAS | None | REC | TP2004<br>TP2005 (GND) | SVR2001 | 1. Set the TU/AV button to the AV position and put the VCR in the no-signal record mode.<br>2. Adjust SVR2001 so that the level is 24 mVrms. |
| 2 | PLAYBACK OUTPUT LEVEL NOTE (1), (2) | Audio signal (1 KHz, −3.8 dBs) from Audio signal generator | REC ⬇ PLAY | AUDIO OUT terminal (CN1021 ① or ③) | SVR2002 | Adjust SVR2002 so that the recorded 1 KHz output level becomes −3.8 dBs in the PLAY mode. |
| 3 | PLAYBACK OUTPUT LEVEL NOTE (1), (3) | Audio signal (1 KHz, −20 dBs) from Audio signal generator | REC ⬇ PLAY | AUDIO OUT terminal | SVR2002 | Adjust SVR2002 so that the recorded 1 KHz output level becomes −8 dBs in the play mode. |

## 2-6. TEST POINT & ADJUSTMENT LOCATION

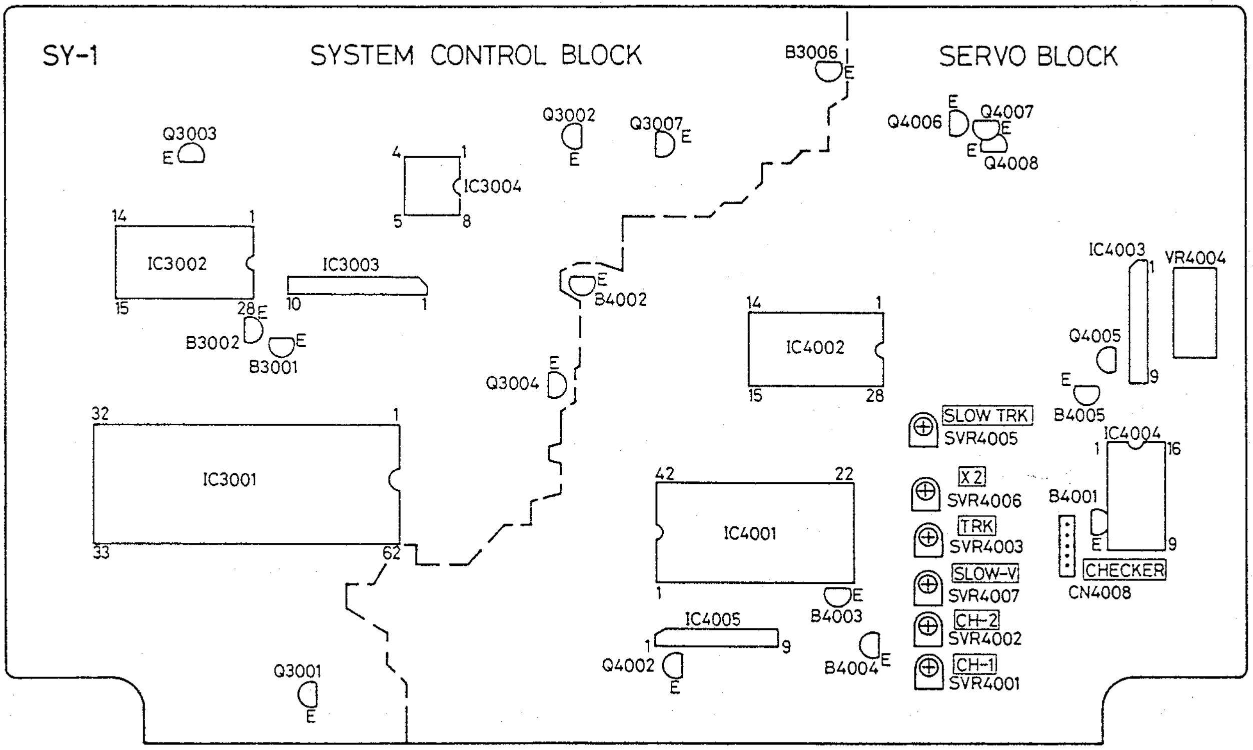

SY-1
SYSTEM CONTROL BLOCK
SERVO BLOCK
B3006
Q3003
Q3002
Q3007
Q4006
Q4007
Q4008
IC3004
IC3002
IC3003
B3002
B3001
B4002
IC4003
VR4004
IC4002
Q4005
Q3004
B4005
IC3001
SLOW TRK
SVR4005
IC4004
X2
SVR4006
B4001
IC4001
TRK
SVR4003
SLOW-V
SVR4007
CHECKER
CN4008
B4003
IC4005
CH-2
SVR4002
Q4002
B4004
CH-1
SVR4001
Q3001
E

Fig. 2-6-1 SY-1 Board (Parts side view)

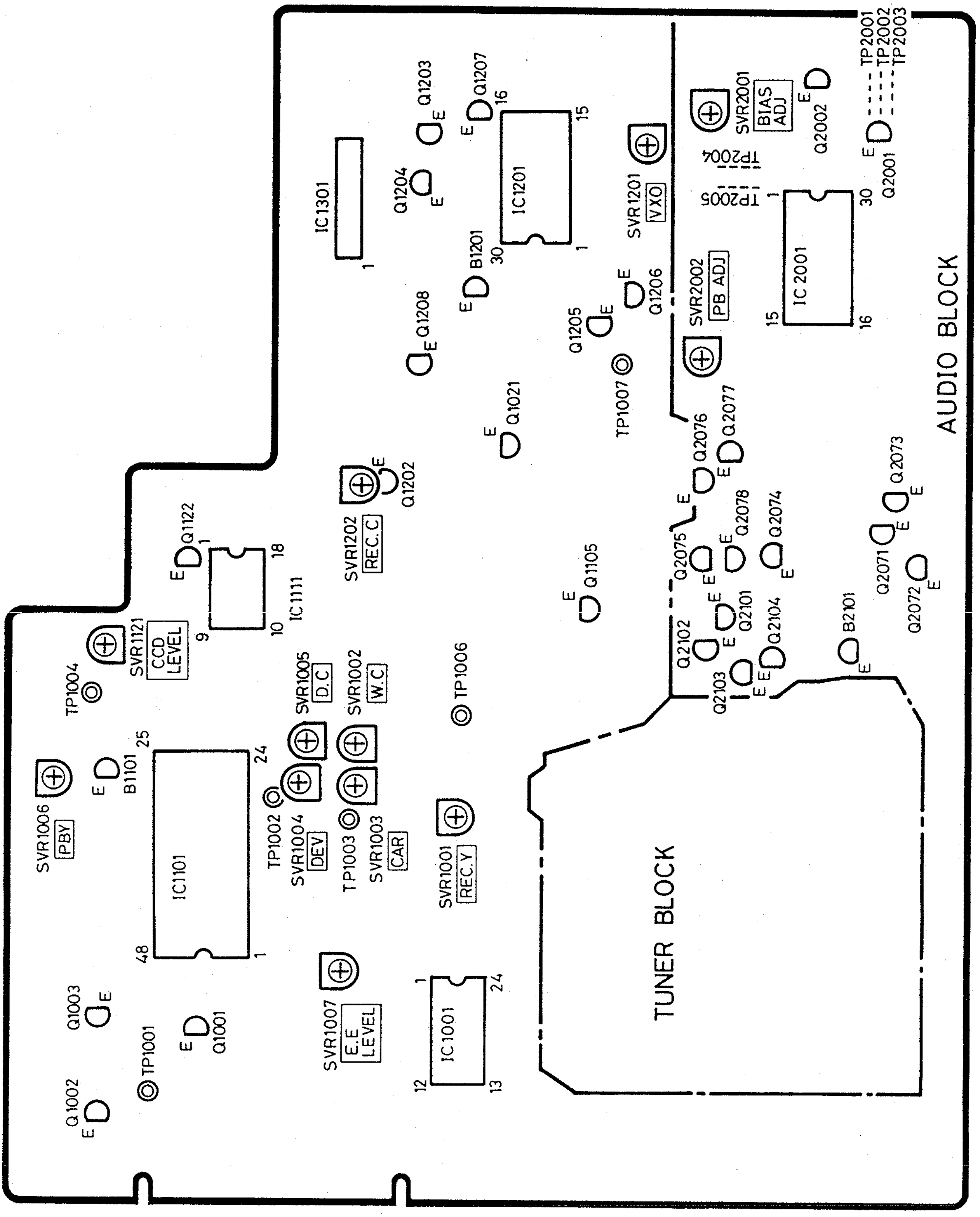

AUDIO BLOCK
TUNER BLOCK
TP2001
TP2002
TP2003
SVR2001
BIAS ADJ
Q2002
Q2001
TP2004
TP2005
IC 2001
SVR2002
PB ADJ
SVR1201
VXO
IC1201
Q1207
Q1203
Q1204
IC1301
B1201
Q1208
Q1206
Q1205
TP1007
Q1021
Q2077
Q2076
Q2078
Q2074
Q2073
Q2075
Q2071
Q2072
Q2101
Q2102
Q2104
Q2103
B2101
Q1105
Q1202
SVR1202
REC.C
Q1122
IC1111
SVR1121
CCD LEVEL
TP1004
SVR1005
D.C
SVR1002
W.C
TP1006
SVR1006
PBY
B1101
IC1101
TP1002
SVR1004
DEV
TP1003
SVR1003
CAR
SVR1001
REC.Y
SVR1007
E.E LEVEL
IC1001
Q1003
Q1001
TP1001
Q1002
E

Fig. 2-6-2 VD-1 Board (Parts side view)

SANYO Electric Co., Ltd.
OSAKA, JAPAN
July/'87/6000 HA Printed in Japan

V437

PARTS LIST &
CIRCUIT DIAGRAMS

SANYO

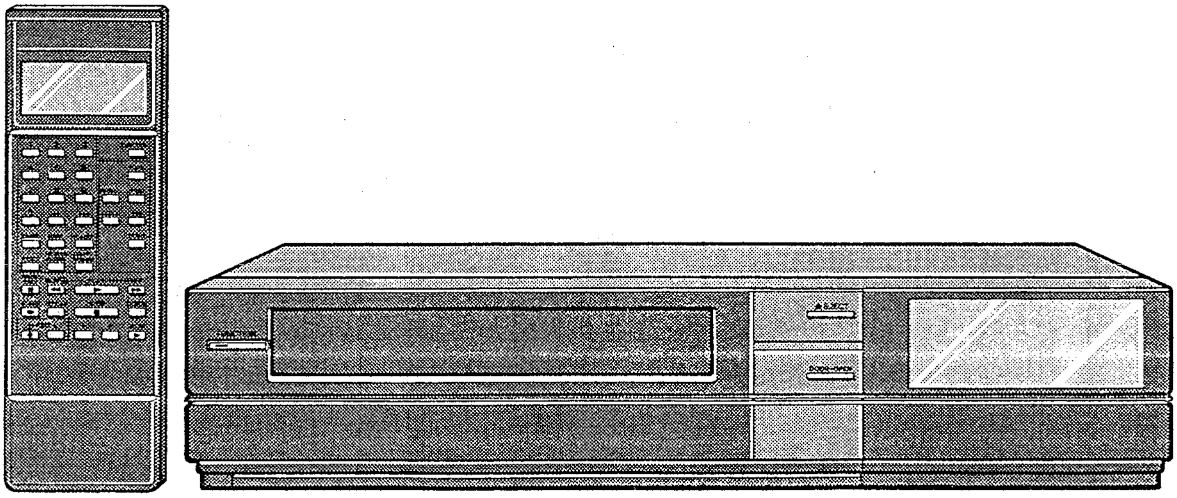
# VHR-3500EX (EUROPE)

# COLOUR VIDEO CASSETTE RECORDER

VHS PAL HQ

Please see other materials with Reference No. given in table below.

| Materials | Model No. | Reference No. |
|---|---|---|
| SERVICE MANUAL | VHR-3400 Series | WM-20889 |
| MECHANISM MANUAL | VHR-3300, 3500 Series | WM-19932 |
| TRAINING MANUAL | VHR-3300 Series etc. | WM-19931 |



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CIRCUIT DIAGRAM

## PRODUCT SAFETY NOTICE

The components designated by a symbol (⚠) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage and voltage ratings shown.

**NOTE** : Parts order must contain Model Number, Part Number and Description.

BP3/EX

REFERENCE NO. WM-21823

## ACCESSORIES

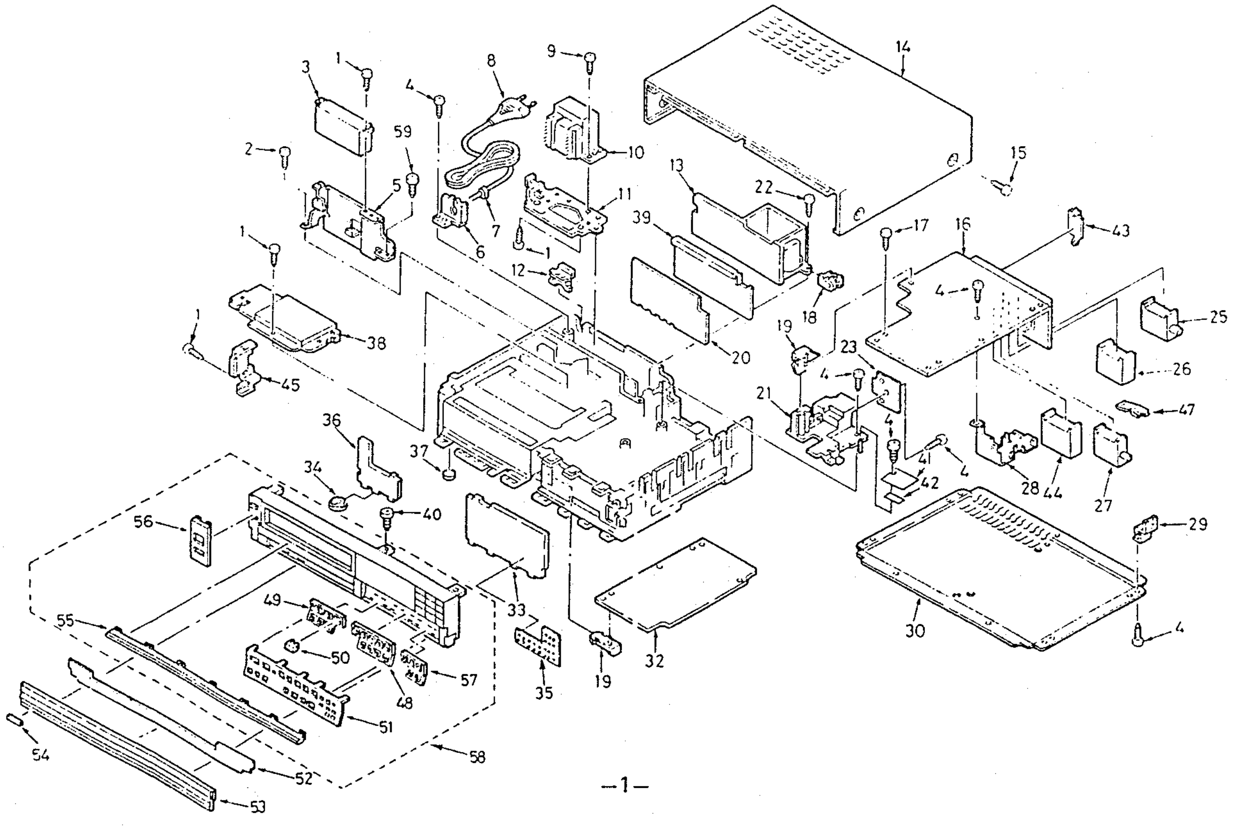
| Ref No. | Part No. | Description |
|---|---|---|
| | 143-6-411T-94601 | INSTRUCTION MANUAL |
| | 143-9-4100-68901 | REMOTE CONTROL UNIT |
| | 4-243V-40600 | ANTENNA OUTPUT CABLE |
| | 143-6-415T-03100 | NOTICE |

## PACKING MATERIALS

| Ref No. | Part No. | Description |
|---|---|---|
| | 143-6-132T-78276 | INNER CARTON |
| | 143-6-251T-16600 | INDIVIDUAL POLY.COVER |
| | 143-6-144T-18700 | PAD,FRONT |
| | 143-6-144T-18800 | PAD,REAR |

## CABINET & CHASSIS PARTS

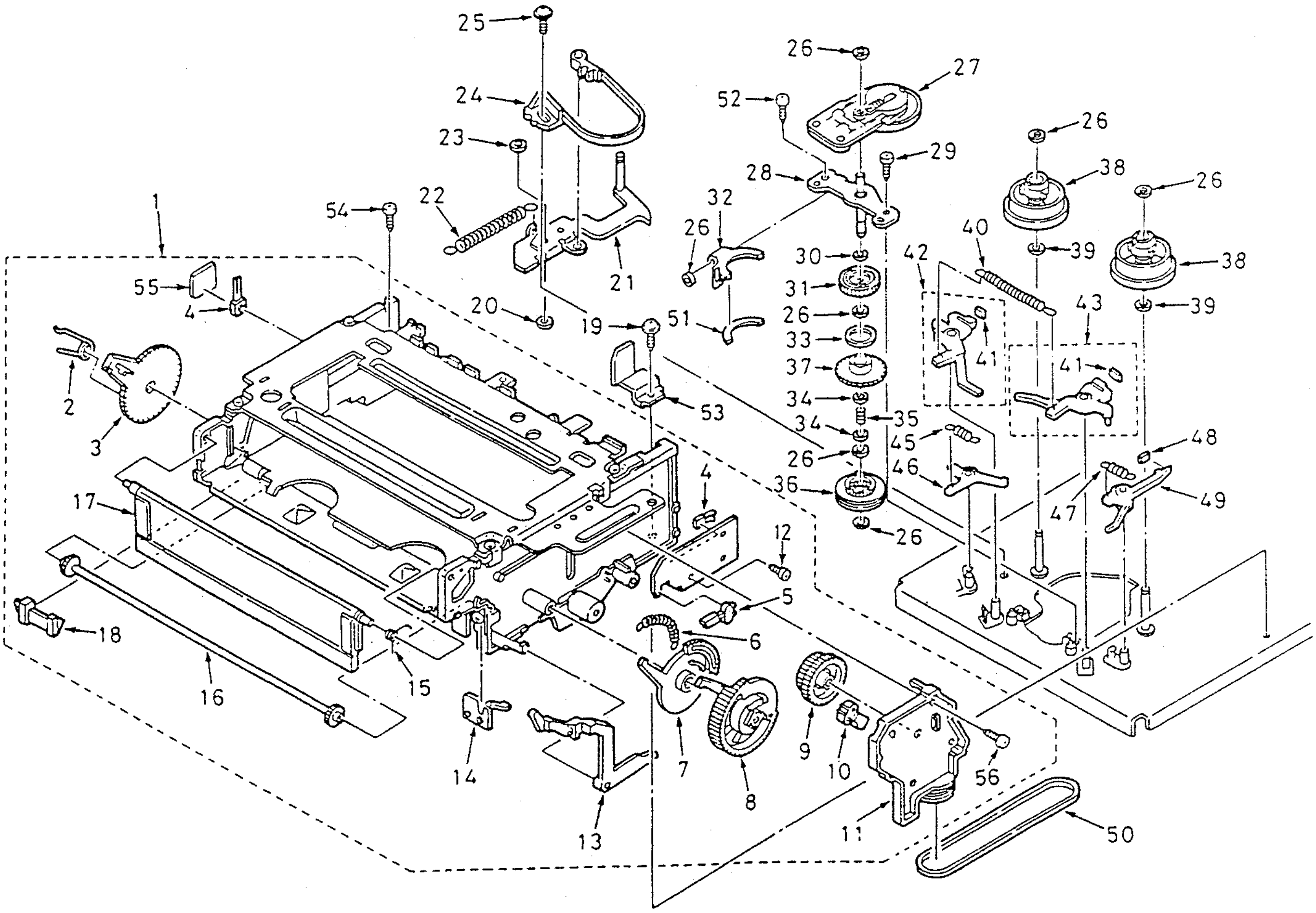
| Ref No. | Part No. | Description |
|---|---|---|
| 1 | 411 021 6405 | SCR S-TPG BIN 3X8 |
| 2 | 411 045 6702 | SCR PAN+SW 3X8 |
| 3 | 143-0-233V-43801 | VP-1 BOARD ASSEMBLY |
| 4 | 411 021 4005 | SCR S-TPG BIN 3X12 |
| 5 | 143-2-351T-79700 | BRACKET,VP-1 BOARD |
| 6 | 143-2-310T-08200 | BRACKET,POWER CORD |
| 7 | 143-2-464T-02700 | FIXER,POWER CORD |
| 8 | ⚠ 143-0-236V-67530 | POWER CORD |
| 9 | 411 021 9109 | SCR S-TPG BIN 4X6 |
| 10 | ⚠ 4-251V-63120 | POWER TRANSFORMER |
| 11 | 143-2-371T-02200 | BRACKET TRANSFORMER |
| 12 | 143-2-210T-09900 | BRACKET,POWER CORD |
| 13 | 143-0-233V-43594 | PW-1 BOARD ASSEMBLY |
| 14 | 143-2-111T-10001 | CABINET |
| 15 | 412 024 7604 | SPECIAL SWITCH,15A BTZ3X10 |
| 16 | 143-0-233V-51202 | VD-1 BOARD ASSEMBLY |
| 17 | 411 021 4203 | SCR S-TPG BIN 3X12 |
| 18 | 143-2-352T-24000 | SPACER, HEAT SINK(INCLUDE PW-1) |
| 19 | 143-2-251T-01400 | HINGE |
| 20 | 143-2-322T-88600 | SHIELD PLATE |
| 21 | 143-2-210T-10100 | BRACKET |
| 22 | 411 021 4302 | SCR S-TPG BIN 3X14 |
| 23 | 143-0-233V-09824 | TM-3 BOARD ASSEMBLY |
| 25 | 143-9-4300-84200 | RF CONVERTER |
| 26 | 143-0-233V-36222 | TN-1 BOARD ASSEMBLY |
| 27 | 4-115V-25500 | TUNER |
| 28 | 143-2-359T-02910 | BRACKET TUNER |
| 29 | 143-2-310T-08500 | BRACKET,CABINET |
| 30 | 143-2-125T-09300 | BOTTOM PLATE |
| 32 | 143-0-233V-53600 | SY-1 BOARD ASSEMBLY |
| 33 | 143-0-233V-49422 | TM-4 BOARD ASSEMBLY |
| 34 | 143-2-163T-08000 | ROTARY KNOB |
| 35 | 143-2-161T-82100 | PUSH BUTTON(INCLUDE TM-4) |
| 36 | 143-0-233V-49521 | TM-5 BOARD ASSEMBLY |
| 37 | 143-2-174T-02402 | STAND |
| 38 | 143-2-322T-85800 | SHIELD PLATE |
| 39 | 143-2-327T-14300 | INSULATOR |
| 40 | 411 020 9100 | SCR S-TPG BRZ+FLG 3X12 |
| 41 | 143-0-233V-62400 | SV-3 BOARD ASSEMBLY |
| 42 | 143-2-327T-15100 | INSULATOR,SV-3 BOARD |
| 43 | 143-2-133T-26000 | COVER,VPS |
| 44 | 143-0-233V-49221 | TN-2 BOARD ASSEMBLY |
| 45 | 143-2-351T-80100 | BRACKET,SHIELD PLATE |
| 47 | 143-2-853T-18800 | SPRING PLATE |
| 48 | 143-2-161T-81800 | PUSH BUTTON,TIMER |
| 49 | 143-2-161T-81710 | PUSH BUTTON,OPERATION |
| 50 | 143-2-161T-82000 | PUSH BUTTON,REC |
| 51 | 143-2-143T-84750 | MARKING PLATE |
| 52 | 143-2-245T-00201 | BACK PLATE,COVER |
| 53 | 143-2-133T-26521 | TIMER COVER |
| 54 | 143-2-142T-06600 | BADGE |
| 55 | 143-2-152T-05211 | SASH |
| 56 | 143-2-153T-23100 | ESCUTCHEON |
| 57 | 143-2-161T-81900 | PUSH BUTTON,TUNING |
| 58 | 143-9-122T-26330 | FRONT PANEL ASSEMBLY |
| 59 | 411 045 4807 | SCR PAN+SW 3X4 |



## MECHANISM PARTS 1

| Ref No. | Part No. | Description |
|---|---|---|
| 1 | 143-9-351T-78554 | BRACKET MTG ASSY |
| 2 | 143-2-851T-89900 | SPRING COIL |
| 3 | 143-2-581T-15600 | GEAR |
| 4 | 407 098 3201 | PHOTO COUPLE PN150SAN |
| 5 | 4-231V-86900 | SPECIAL SWITCH |
| 6 | 143-2-851T-89800 | SPRING COIL |
| 7 | 143-2-581T-15500 | GEAR |
| 8 | 143-2-581T-15400 | GEAR |
| 9 | 143-2-581T-15800 | GEAR |
| 10 | 4-231V-87100 | SPECIAL SWITCH |
| 11 | 143-0-351T-78300 | BRACKET MTG ASSY |
| 12 | 411 021 6405 | SCR S-TPG BIN 3X8 |
| 13 | 143-2-741T-64500 | LEVER |
| 14 | 143-2-853T-18200 | SPRING PLATE |
| 15 | 143-2-851T-90000 | SPRING COIL |
| 16 | 143-0-751T-99200 | SHAFT ASSY |
| 17 | 143-2-133T-24420 | COMPARTMENT LID |
| 18 | 4-231V-87000 | SPECIAL SWITCH |
| 19 | 411 036 3208 | SCR PAN+SW+W 3X10 |
| 20 | 412 012 8309 | SPECIAL WASHER |
| 21 | 143-0-741T-65200 | LEVER ASSY |
| 22 | 143-2-851T-87701 | SPRING COIL |
| 23 | 412 021 4903 | SPECIAL WASHER |
| 24 | 143-0-711T-02101 | BRAKE BAND ASSY |
| 25 | 411 046 9702 | SCR PAN+SW+W 3X6 |
| 26 | 412 015 9600 | SPECIAL WASHER |
| 27 | 143-0-662T-15621 | ROLLER ASSY REEL DRIVE |
| 28 | 143-0-351T-76900 | BRACKET MTG ASSY |
| 29 | 411 023 4201 | SCR S-TPG PAN 3X10 |
| 30 | 412 015 8900 | SPECIAL WASHER |
| 31 | 143-2-661T-72800 | PULLEY |

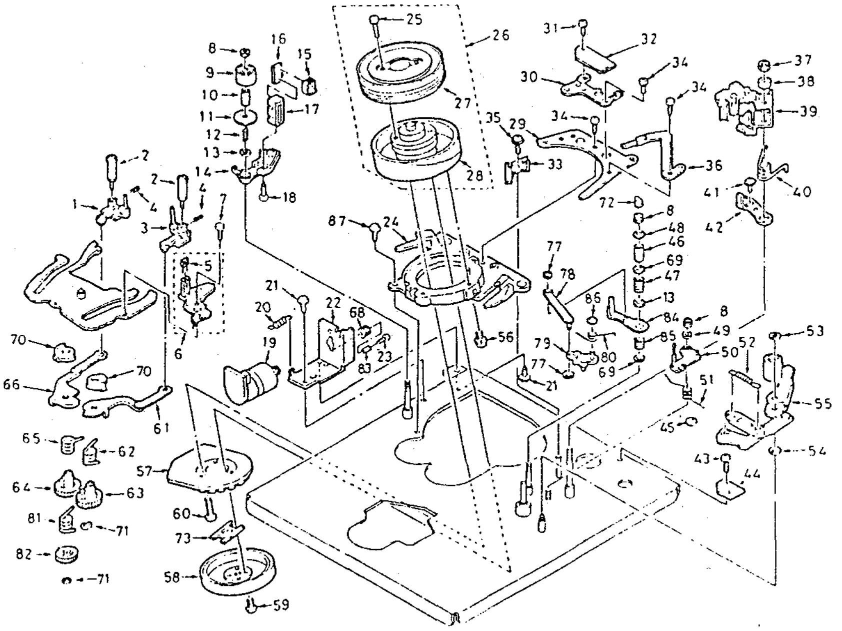
| Ref No. | Part No. | Description |
|---|---|---|
| 32 | 143-2-741T-62100 | LEVER |
| 33 | 412 024 8601 | SPECIAL WASHER 0.5T |
| 34 | 412 015 8702 | SPECIAL WASHER |
| 35 | 143-2-851T-86800 | SPRING COIL 0.5T |
| 36 | 143-2-661T-72701 | PULLEY |
| 37 | 143-2-581T-13700 | GEAR |
| 38 | 143-0-531T-05421 | REEL PLATE ASSY |
| 39 | 412 015 8504 | SPECIAL WASHER D3.1XD6X0.5T |
| or | 412 015 8603 | SPECIAL WASHER D3.1XD6X0.25T |
| or | 412 015 8702 | SPECIAL WASHER D3.1XD6X0.13T |
| or | 412 015 8801 | SPECIAL WASHER 0.2T |
| or | 412 015 8900 | SPECIAL WASHER 3.1X6X0.4T |
| or | 412 021 5306 | SPECIAL WASHER D3.1XD6X0.3T |
| 40 | 143-2-851T-87600 | SPRING COIL |
| 41 | 143-2-712T-05200 | BRAKE SHOE |
| 42 | 143-0-741T-62200 | LEVER ASSY |
| 43 | 143-0-741T-62300 | LEVER ASSY |
| 45 | 143-2-851T-92501 | SPRING COIL |
| 46 | 143-2-741T-63400 | LEVER |
| 47 | 143-2-851T-92100 | SPRING COIL |
| 48 | 143-2-712T-05501 | BRAKE SHOE |
| 49 | 143-2-741T-62600 | LEVER |
| 50 | 143-2-564T-05300 | BELT FLONT LOADING |
| 51 | 143-2-246T-45500 | SHEET |
| 52 | 411 023 9800 | SCR S-TPG PAN 3X8 |
| 53 | 143-2-351T-80200 | BRACKET MTG |
| 54 | 411 047 7905 | SCR PAN+FLG 3X7 |
| 55 | 143-2-135T-32900 | COVER |
| 56 | 411 021 3503 | SCR S-TPG BIN 3X10 |



**MECHANISM PARTS 2**

| Ref No. | Part No. | Description |
|---|---|---|
| 1 | 143-0-822T-03021 | BRACKET TAPE GUIDE ASSY |
| 2 | 143-0-821T-14400 | TAPE GUIDE ASSY |
| or | 143-0-821T-14500 | TAPE GUIDE ASSY |
| 3 | 143-0-822T-03121 | BRACKET TAPE GUIDE ASSY |
| 4 | 411 063 0706 | SCR SET HEX-SCT 2X2 |
| 5 | 407 094 2000 | LED LN59-SAN |
| 6 | 143-0-351T-79201 | BRACKET MTG ASSY |
| 7 | 412 021 1209 | SPECIAL SCREW |
| 8 | 412 015 8306 | SPECIAL NUT |
| 9 | 143-2-662T-15400 | ROLLER |
| 10 | 143-2-681T-17501 | SLEEVE |
| or | 143-2-681T-17500 | SLEEVE |
| 11 | 412 023 2105 | WASHER F 3X18X2 |
| 12 | 143-2-851T-91300 | SPRING COIL |
| 13 | 412 024 8502 | SPECIAL WASHER |
| 14 | 143-2-741T-63700 | LEVER |
| 15 | 4-235V-46502 | SOCKET |
| 16 | 4-233V-26300 | P C BOARD |
| 17 | 4-242V-24700 | MAGNETIC HEAD |
| 18 | 411 002 4901 | SCR PAN 2X4 |
| 19 | 4-527V-03010 | COMMUTATE MOTOR |
| 20 | 143-2-851T-89200 | SPRING COIL |
| 21 | 411 047 6809 | SCR PAN+FLG 3X4 |
| or | 411 047 8100 | SCR PAN+FLG 3X8 |
| 22 | 143-2-378T-02901 | BRACKET MOTOR |
| 23 | 411 047 7509 | SCR PAN+FLG 3X6 |
| 24 | 143-2-776T-02500 | BRACKET CYLINDER |
| or | 143-2-776T-02520 | BRACKET CYLINDER |
| 25 | 411 037 6208 | SCR PAN+W 3X8 |
| 26 | 143-0-771T-12520 | CYLINDER ROTARY HEAD ASSY |
| 27 | 143-0-771T-12500 | CYLINDER ROTARY HEAD ASSY |
| 28 | 143-0-771T-11600 | CYLINDER ROTARY HEAD ASSY |
| 29 | 143-2-351T-77500 | BRACKET MTG |
| 30 | 143-2-377T-21700 | BRACKET P C BOARD |
| 31 | 411 003 8809 | SCR PAN+SW 2.6X6 |
| 32 | 143-0-233V-48000 | MC30 ASSY |
| 33 | 143-2-351T-80000 | BRACKET MTG |
| or | 143-2-351T-80001 | BRACKET MTG |
| 34 | 411 003 8908 | SCR PAN+SW 3X6 |
| 35 | 411 020 9902 | SCR S-TPG BRZ+FLG 3X8 |
| or | 411 020 8905 | SCR S-TPG BRZ+FLG 3X10 |
| 36 | 143-0-324T-00925 | EARTH PLATE ASSY |
| 37 | 412 015 8207 | SPECIAL NUT |
| 38 | 143-2-352T-22800 | SPACER |
| 39 | 143-9-242V-27500 | MAGNETIC HEAD ASSY |
| 40 | 143-2-851T-89500 | SPRING COIL |
| 41 | 411 036 5301 | SCR PAN+SW+W 3X6 |

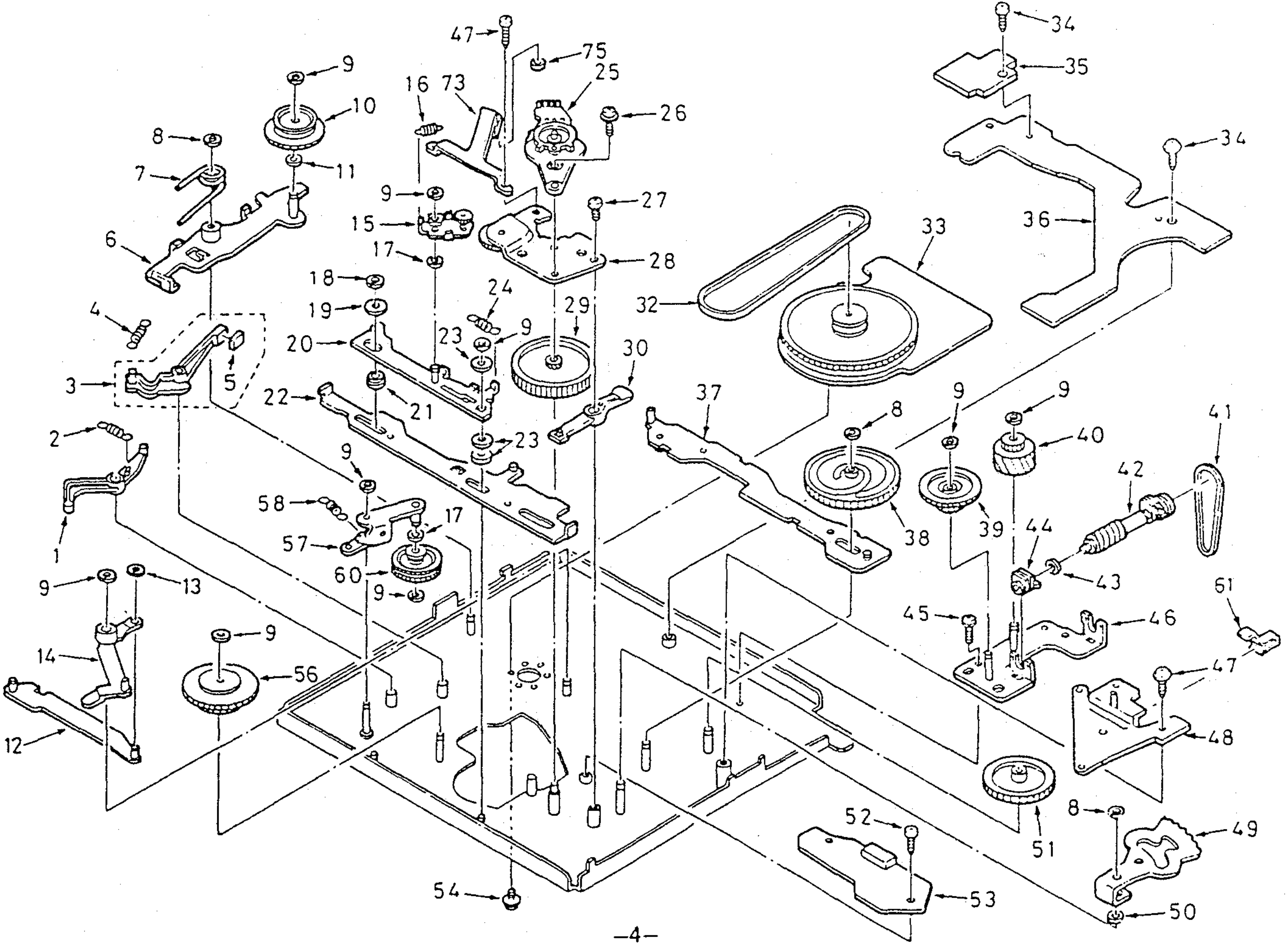
| Ref No. | Part No. | Description |
|---|---|---|
| 42 | 143-2-375T-11000 | BRACKET HEAD |
| 43 | 411 046 9702 | SCR PAN+SW+W 3X6 |
| 44 | 4-221V-18900 | RESISTOR |
| 45 | 412 021 4903 | SPECIAL WASHER |
| 46 | 143-2-821T-14100 | TAPE GUIDE |
| 47 | 143-2-851T-91300 | SPRING COIL |
| 48 | 412 023 1900 | WASHER F 3X6.5X0.5 |
| 49 | 412 015 8504 | SPECIAL WASHER |
| 50 | 143-0-741T-63300 | LEVER ASSY |
| 51 | 143-2-851T-87900 | SPRING COIL |
| 52 | 143-2-851T-87800 | SPRING COIL |
| 53 | 412 021 5207 | SPECIAL WASHER |
| 54 | 412 012 9108 | SPECIAL WASHER |
| 55 | 143-0-545T-02830 | LEVER PINCH ROLLER ASSY |
| 56 | 411 045 5408 | SCR PAN+SW 3X5 |
| 57 | 4-264V-17400 | MAGNETIC COIL |
| 58 | 143-2-774T-03110 | ROTOR |
| 59 | 411 044 9001 | SCR PAN+SW 2.3X6 |
| 60 | 411 044 8301 | SCR PAN+SW 2.3X10 |
| 61 | 143-0-741T-64122 | LEVER ASSY |
| 62 | 143-2-851T-89000 | SPRING COIL |
| 63 | 143-2-581T-15200 | GEAR |
| 64 | 143-2-581T-16400 | GEAR |
| 65 | 143-2-851T-90700 | SPRING COIL |
| 66 | 143-0-741T-64222 | LEVER ASSY |
| 68 | 143-2-445T-21300 | RUBBER CUSHION |
| 69 | 412 021 7102 | SPECIAL WASHER |
| or | 412 021 8901 | SPECIAL WASHER |
| 70 | 143-2-352T-23500 | SPACER |
| 71 | 411 000 9908 | RING E 3 |
| 72 | 143-2-681T-21100 | SLEEVE |
| 73 | 143-2-352T-23300 | SPACER |
| 77 | 412 015 9600 | SPECIAL WASHER |
| 78 | 143-0-741T-66000 | LEVER ASSY |
| 79 | 143-0-741T-66100 | LEVER ASSY |
| 80 | 143-2-851T-91200 | SPRING COIL |
| 81 | 143-2-851T-90800 | SPRING COIL |
| 82 | 143-2-581T-16500 | GEAR |
| 83 | 143-2-352T-24700 | SPACER |
| 84 | 143-0-741T-65900 | LEVER ASSY |
| 85 | 143-2-851T-92400 | SPRING COIL |
| 86 | 412 023 2006 | WASHER F 3X9.5X0.5 |
| 87 | 411 047 5307 | SCR PAN+FLG 3X10 |



## MECHANISM PARTS 3

| Ref No. | Part No. | Description |
|---|---|---|
| 1 | 143-2-741T-62501 | LEVER |
| 2 | 143-2-851T-88800 | SPRING COIL |
| 3 | 143-0-741T-65100 | LEVER ASSY |
| 4 | 143-2-851T-92600 | SPRING COIL |
| 5 | 143-2-712T-05301 | BRAKE SHOE |
| 6 | 143-0-741T-65800 | LEVER ASSY |
| 7 | 143-2-851T-91100 | SPRING COIL |
| 8 | 412 021 4903 | SPECIAL WASHER |
| 9 | 412 015 9600 | SPECIAL WASHER |
| 10 | 143-0-581T-15000 | GEAR ASSY |
| 11 | 412 012 7708 | SPECIAL WASHER |
| or | 412 015 8504 | SPECIAL WASHER |
| 12 | 143-0-741T-65600 | LEVER ASSY |
| 13 | 412 015 9501 | SPECIAL WASHER |
| 14 | 143-0-741T-65700 | LEVER ASSY |
| 15 | 143-0-741T-62921 | LEVER ASSY |
| 16 | 143-2-851T-87500 | SPRING COIL |
| 17 | 412 015 8504 | SPECIAL WASHER |
| 18 | 412 021 4903 | SPECIAL WASHER 0.6T |
| 19 | 412 021 6105 | SPECIAL WASHER |
| 20 | 143-0-731T-16300 | SLIDE ASSY |
| 21 | 143-2-681T-19800 | SLEEVE |
| 22 | 143-0-731T-16400 | SLIDE ASSY |
| 23 | 412 023 1801 | WASHER F 3.2X10X0.5 |
| 24 | 143-2-851T-87400 | SPRING COIL |
| 25 | 4-231V-87400 | SPECIAL SWITCH |
| 26 | 411 036 2805 | SCR PAN+SW+W 2.6X6 |
| 27 | 411 024 4101 | SCR S-TPG PAN+FLG 2.6X6 |
| 28 | 143-0-581T-14300 | GEAR ASSY |
| 29 | 143-2-581T-16100 | GEAR |
| 30 | 143-2-741T-63600 | LEVER |
| 32 | 143-2-564T-05001 | BELT REEL DRIVE |

| Ref No. | Part No. | Description |
|---|---|---|
| 33 | 4-527V-54300 | BRUSHLESS MOTOR |
| 34 | 411 023 4003 | SCR S-TPG PAN 3X10 |
| 35 | 143-2-210T-09600 | BRACKET |
| 36 | 143-0-233V-26750 | MC2 ASSY |
| 37 | 143-0-731T-16600 | SLIDE ASSY |
| 38 | 143-2-581T-16000 | GEAR |
| 39 | 143-2-581T-14600 | GEAR |
| 40 | 143-2-581T-14500 | GEAR |
| 41 | 143-2-564T-04900 | BELT TAPE LOADING |
| 42 | 143-0-581T-14400 | GEAR ASSY |
| 43 | 412 012 7708 | SPECIAL WASHER |
| 44 | 143-2-681T-19900 | SLEEVE |
| 45 | 411 045 6702 | SCR PAN+SW 3X8 |
| 46 | 143-0-351T-77200 | BRACKET MTG ASSY |
| 47 | 411 024 4309 | SCR S-TPG PAN+FLG 2.6X8 |
| 48 | 143-2-351T-79600 | BRACKET MTG |
| 49 | 143-0-581T-16300 | GEAR ASSY |
| 50 | 412 012 8309 | SPECIAL WASHER |
| 51 | 143-2-581T-14700 | GEAR |
| 52 | 411 023 9800 | SCR S-TPG PAN 3X8 |
| 53 | 143-0-233V-26621 | MC1 ASSY |
| 54 | 411 047 6809 | SCR PAN+FLG 3X4 |
| 56 | 143-0-581T-14001 | GEAR ASSY |
| 57 | 143-0-741T-62800 | LEVER ASSY |
| 58 | 143-2-851T-87300 | SPRING COIL |
| 60 | 143-0-581T-13801 | GEAR ASSY |
| 61 | 143-2-324T-01000 | EARTH PLATE |
| 73 | 143-2-310T-09300 | BRACKET |
| 75 | 411 102 9905 | WASHER Y 3.2X8X1 |



# ELECTRICAL PARTS

**NOTE:**

* Materials of Capacitors are abbreviated as follows;

| | |
|---|---|
| ALUMINUM ........... | Aluminum Electrolytic Capacitor |
| BC CON ............. | Barrier Layer Ceramic Capacitor |
| CERAMIC ............ | Ceramic Capacitor |
| EDL ................. | Electric Double Layer Capacitor |
| ELECT ................ | Electrolytic Capacitor |
| MYLAR ............... | Mylar Film Capacitor |
| NON POLARIZED ...... | Non Polarized Electrolytic Capacitor |
| POLYPRO ............ | Polypropylene Capacitor |

* Tolerance of Capacitor, Resistors and Other parts are noted with follow symboles;

| | |
|---|---|
| A.............. | +75-10% |
| F.................. | ±1% |
| G.................. | ±2% |
| J.................. | ±5% |
| K................. | ±10% |
| M ................. | ±20% |
| N ................. | ±30% |
| P............... | +100-0% |
| Z.............. | +80-20% |

### VD-1 BOARD (VIDEO)
### NO.143-0-233V-51202

| Location | Part No. | Description |
|---|---|---|
| | 143-2-464T-07700 | FIXER,VD-1 BOARD |
| | 143-2-377T-21800 | TERMINAL BOARD |
| | 143-2-143T-81810 | PLATE,JACKS |
| | 143-2-143T-81900 | PLATE,RF CONVERTER |
| | | **(COMPOSITE)** |
| B1201 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |
| | | **(CAPACITORS)** |
| C1001 | 403 039 3507 | ELECT 470MF M 6.3V |
| C1002 | 403 042 2405 | ELECT 100MF M 16V |
| C1003 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1004 | 403 024 1501 | CERAMIC 39PF J 50V |
| C1005 | 403 043 9106 | ELECT 47MF M 16V |
| C1006 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1007 | 403 024 1501 | CERAMIC 39PF J 50V |
| C1008 | 403 038 6202 | ELECT 22MF M 6.3V |
| C1034 | 403 042 2405 | ELECT 100MF M 16V |
| C1035 | 403 041 2109 | ELECT 47MF M 10V |
| C1036 | 403 041 2109 | ELECT 47MF M 10V |
| C1037 | 403 001 2903 | CERAMIC 0.1MF M 16V |
| C1038 | 403 041 8804 | ELECT 10MF M 16V |
| C1040 | 403 041 8804 | ELECT 10MF M 16V |
| C1041 | 403 049 0008 | ELECT 1MF M 50V |
| C1042 | 403 049 0008 | ELECT 1MF M 50V |
| C1051 | 403 042 2405 | ELECT 100MF M 16V |
| C1052 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1101 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1102 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1103 | 403 028 3402 | CERAMIC 56PF J 50V |
| C1104 | 403 075 4506 | CERAMIC 820PF K 50V |
| C1105 | 403 047 0604 | ELECT 4.7MF M 25V |
| C1106 | 403 039 2609 | ELECT 47MF M 6.3V |
| C1107 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1108 | 403 051 1307 | ELECT 4.7MF M 50V |
| C1109 | 403 071 6207 | CERAMIC 220PF K 50V |
| C1110 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1111 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1112 | 403 001 8004 | CERAMIC 0.047MF M 16V |
| C1113 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1114 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1115 | 403 049 9803 | ELECT 2.2MF M 50V |
| C1119 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1120 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C1121 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1122 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1123 | 403 050 6600 | ELECT 3.3MF M 50V |
| C1124 | 403 050 7003 | ELECT 3.3MF M 50V |
| C1125 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1126 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1127 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1128 | 403 070 7809 | CERAMIC 150PF K 50V |
| C1129 | 403 071 2001 | CERAMIC 180PF K 50V |
| C1130 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1131 | 403 048 6308 | ELECT 0.47MF M 50V |
| C1132 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1133 | 403 073 2702 | CERAMIC 390PF J 50V |
| C1134 | 403 073 7004 | CERAMIC 470PF K 50V |
| C1135 | 403 072 4707 | CERAMIC 270PF K 50V |
| C1136 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1137 | 403 014 2600 | CERAMIC 18PF J 50V |
| C1140 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1141 | 403 026 2209 | CERAMIC 47PF J 50V |
| C1142 | 403 073 7004 | CERAMIC 470PF K 50V |
| C1143 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1144 | 403 073 3204 | CERAMIC 390PF K 50V |
| C1145 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1146 | 403 022 7703 | CERAMIC 33PF J 50V |
| C1153 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1154 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1155 | 403 038 9708 | ELECT 330MF M 6.3V |
| C1157 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1161 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1162 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1163 | 403 041 2109 | ELECT 47MF M 10V |
| C1166 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1167 | 403 014 2600 | CERAMIC 18PF J 50V |
| C1168 | 403 010 7807 | CERAMIC 12PF J 50V |
| C1174 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1175 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1176 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1177 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1178 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1179 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C1180 | 403 001 8004 | CERAMIC 0.047MF M 16V |
| C1181 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C1182 | 403 026 2209 | CERAMIC 47PF J 50V |
| C1183 | 403 028 3402 | CERAMIC 56PF J 50V |
| C1201 | 403 026 0700 | CERAMIC 47PF J 50V |
| C1202 | 403 049 0008 | ELECT 1MF M 50V |
| C1203 | 403 001 7007 | CERAMIC 3900PF K 16V |
| C1204 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1205 | 403 049 0008 | ELECT 1MF M 50V |
| C1206 | 403 059 6007 | POLYESTER 0.022MF K 50V |
| C1207 | 403 023 9607 | CERAMIC 39PF J 50V |
| C1208 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1209 | 403 027 9405 | CERAMIC 51PF J 50V |
| C1210 | 403 017 4304 | CERAMIC 200PF J 50V |
| C1211 | 403 049 0008 | ELECT 1MF M 50V |
| C1213 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1214 | 403 049 0008 | ELECT 1MF M 50V |
| C1215 | 403 022 2005 | CERAMIC 30PF J 50V |
| C1216 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1218 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1223 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1224 | 403 049 0008 | ELECT 1MF M 50V |
| C1231 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1232 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1234 | 403 071 6207 | CERAMIC 220PF K 50V |
| C1235 | 403 075 3400 | CERAMIC 82PF K 50V |

| Location | Part No. | Description |
|---|---|---|
| C1235 | 403 033 4203 | CERAMIC 82PF J 50V |
| C1237 | 403 070 4105 | CERAMIC 120PF K 50V |
| C1239 | 403 072 7500 | CERAMIC 330PF J 50V |
| C1241 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1242 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1243 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1244 | 403 039 2104 | ELECT 47MF M 6.3V |
| C1245 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1252 | 403 003 3304 | CERAMIC 0.022MF M 25V |
| C1253 | 403 049 0008 | ELECT 1MF M 50V |
| C1254 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1256 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C1257 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C1260 | 403 041 8804 | ELECT 10MF M 16V |
| C1261 | 403 038 6202 | ELECT 22MF M 6.3V |
| C1262 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1263 | 403 041 8804 | ELECT 10MF M 16V |
| C1264 | 403 043 9106 | ELECT 47MF M 16V |
| C1301 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1302 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1303 | 403 043 9106 | ELECT 47MF M 16V |
| C1304 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C1305 | 403 068 9402 | CERAMIC 100PF K 50V |
| C1306 | 403 046 1602 | ELECT 3.3MF M 25V |
| C1307 | 403 046 1602 | ELECT 3.3MF M 25V |
| C1308 | 403 046 9905 | ELECT 4.7MF M 25V |
| C1309 | 403 042 2405 | ELECT 100MF M 16V |
|  |  | **(DIODES)** |
| D1001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1031 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1032 | 407 070 8408 | ZENER DIODE GZS9.1Y-TB |
| or | 407 051 8106 | ZENER DIODE GZS9.1Z |
| or | 407 053 8807 | ZENER DIODE MTZ9.1B-T-77 |
| or | 407 053 8906 | ZENER DIODE MTZ9.1C-T-77 |
| D1102 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1104 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1105 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1111 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1201 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1202 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D1203 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
|  |  | **(INTEGRATED CIRCUITS)** |
| IC1001 | 409 114 4407 | IC LA7223 |
| IC1101 | 409 111 9603 | IC AN3230K |
| IC1111 | 409 112 1606 | IC MN3811 |
| IC1201 | 409 074 5803 | IC TA8632N |
| IC1301 | 409 074 3502 | IC LA7311 |
|  |  | **(COILS)** |
| L1001 | 4–253V–97125 | HF CHOKE 100UH K |
| L1002 | 4–253V–97125 | HF CHOKE 100UH K |
| L1003 | 4–253V–97125 | HF CHOKE 100UH K |
| L1101 | 4–253V–97125 | HF CHOKE 100UH K |
| L1102 | 4–253V–97125 | HF CHOKE 100UH K |
| L1104 | 4–253V–97123 | HF CHOKE 68UH K |
| L1105 | 4–253V–97124 | HF CHOKE 82UH K |
| L1106 | 4–253V–97125 | HF CHOKE 100UH K |
| L1107 | 4–253V–97126 | HF CHOKE 120UH K |
| L1108 | 4–253V–97128 | HF CHOKE 180UH K |
| L1109 | 4–253V–74323 | HF CHOKE 18UH K |
| L1110 | 4–253V–85915 | HF CHOKE 15UH K |
| L1121 | 4–253V–97125 | HF CHOKE 100UH K |
| L1122 | 4–253V–74327 | HF CHOKE 39UH K |
| L1202 | 4–253V–97116 | HF CHOKE 18UH K |
| L1205 | 4–253V–97115 | HF CHOKE 15UH K |
| L1209 | 4–253V–97118 | HF CHOKE 27UH K |
| L1210 | 4–253V–97133 | HF CHOKE 470UH K |
| L1211 | 4–253V–97125 | HF CHOKE 100UH K |
| L1242 | 4–253V–74328 | HF CHOKE 47UH K |
| L1260 | 4–253V–78530 | HF CHOKE 33MH K |
| L1261 | 4–253V–97125 | HF CHOKE 100UH K |
|  |  | **(TRANSISTORS)** |
| Q1001 | 405 004 4601 | TR 2SA608-F-SPA |
| Q1002 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1003 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1021 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1105 | 405 006 7204 | TR 2SA984K-F |
| Q1122 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1202 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1203 | 405 016 0905 | TR 2SC2839-E-SPA |
| or | 405 015 2504 | TR 2SC2669-O |
| Q1204 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1205 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1206 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
| Q1207 | 405 004 4007 | TR 2SA608-E-SPA |
| or | 405 004 4601 | TR 2SA608-F-SPA |
| Q1208 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| or | 405 011 8401 | TR 2SC1740S-Q |
| or | 405 011 8500 | TR 2SC1740S-R |
|  |  | **(RESISTORS)** |
| R1001 | 401 022 0700 | CARBON 68 JA 1/4W |
| R1002 | 401 021 1807 | CARBON 560 JA 1/4W |
| R1003 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R1004 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1005 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1006 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1007 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1008 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1009 | 401 021 1807 | CARBON 560 JA 1/4W |
| R1010 | 401 022 6702 | CARBON 75 JA 1/4W |
| R1031 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1032 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1035 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1041 | 401 012 8006 | CARBON 100K JA 1/4W |
| R1042 | 401 022 7600 | CARBON 7.5K JA 1/4W |
| R1043 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R1044 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R1045 | 401 012 8006 | CARBON 100K JA 1/4W |
| R1046 | 401 017 2702 | CARBON 27K JA 1/4W |
| R1047 | 401 014 5102 | CARBON 15K JA 1/4W |
| R1048 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1106 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1107 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1108 | 401 021 4907 | CARBON 560K JA 1/4W |
| R1109 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1110 | 401 015 2605 | CARBON 1.8K JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R1111 | 401 020 2805 | CARBON 47K JA 1/4W |
| R1112 | 401 017 0708 | CARBON 270 JA 1/4W |
| R1113 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R1114 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1115 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1116 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1118 | 401 023 6909 | CARBON 910 JA 1/4W |
| R1120 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1121 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1123 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R1124 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1125 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1129 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R1130 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1136 | 401 014 8509 | CARBON 1.6K JA 1/4W |
| R1137 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R1138 | 401 018 2701 | CARBON 330 JA 1/4W |
| R1139 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1142 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1144 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1145 | 401 016 2505 | CARBON 220 JA 1/4W |
| R1147 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1148 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1150 | 401 022 7600 | CARBON 7.5K JA 1/4W |
| R1153 | 401 020 0801 | CARBON 470 JA 1/4W |
| R1154 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R1162 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R1163 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1171 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1172 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1173 | 401 016 6404 | CARBON 2.2M JA 1/4W |
| R1201 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1202 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1203 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1204 | 401 013 4106 | CARBON 120 JA 1/4W |
| R1205 | 401 012 5708 | CARBON 1K JA 1/4W |
| R1206 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1207 | 401 019 1802 | CARBON 3.9K JA 1/4W |
| R1208 | 401 015 9406 | CARBON 2K JA 1/4W |
| R1209 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1210 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1212 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1213 | 401 018 4804 | CARBON 33K JA 1/4W |
| R1214 | 401 018 0202 | CARBON 300K JA 1/4W |
| R1215 | 401 018 5702 | CARBON 330K JA 1/4W |
| R1216 | 401 017 9206 | CARBON 3K JA 1/4W |
| R1217 | 401 017 9206 | CARBON 3K JA 1/4W |
| R1218 | 401 021 1807 | CARBON 560 JA 1/4W |
| R1222 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R1223 | 401 016 4707 | CARBON 22K JA 1/4W |
| R1224 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1226 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1227 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R1228 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1229 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1231 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1234 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1235 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1238 | 401 018 4903 | CARBON 33K JA 1/4W |
| R1240 | 401 023 2703 | CARBON 8.2K JA 1/4W |
| R1241 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R1242 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1243 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1244 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1245 | 401 014 2804 | CARBON 150 JA 1/4W |
| R1247 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1248 | 401 013 6308 | CARBON 12K JA 1/4W |
| R1250 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R1251 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R1252 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1253 | 401 023 4509 | CARBON 820K JA 1/4W |
| R1254 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1255 | 401 018 2701 | CARBON 330 JA 1/4W |
| R1256 | 401 020 0702 | CARBON 470 JA 1/4W |
| R1257 | 401 022 1806 | CARBON 680 JA 1/4W |
| R1301 | 401 105 3701 | CARBON 18K JA 1/4W |
| R1302 | 401 016 7906 | CARBON 2.4K JA 1/4W |
| R1303 | 401 012 5609 | CARBON 1K JA 1/4W |
| R1304 | 401 012 6903 | CARBON 10K JA 1/4W |
| R1305 | 401 012 7009 | CARBON 10K JA 1/4W |
| R1308 | 401 023 1607 | CARBON 820 JA 1/4W |
| R1309 | 401 105 3701 | CARBON 18K JA 1/4W |
| R1310 | 401 012 9201 | CARBON 1M JA 1/4W |
| R1311 | 401 012 9201 | CARBON 1M JA 1/4W |
|  |  | **(SEMI VARIABLE RESISTORS)** |
| SVR1001 | 4–222V–69102 | SEMI VR 500 OHM |
| SVR1002 | 4–222V–69108 | SEMI VR 20K OHM |
| or | 4–222V–68914 | SEMI VR 22K OHM |
| SVR1003 | 4–222V–69107 | SEMI VR 10K OHM |
| or | 4–222V–68912 | SEMI VR 10K OHM |
| SVR1004 | 4–222V–69107 | SEMI VR 10K OHM |
| or | 4–222V–68912 | SEMI VR 10K OHM |
| SVR1005 | 4–222V–69108 | SEMI VR 20K OHM |
| or | 4–222V–68914 | SEMI VR 22K OHM |
| SVR1006 | 4–222V–69108 | SEMI VR 20K OHM |
| or | 4–222V–68914 | SEMI VR 22K OHM |
| SVR1007 | 4–222V–69108 | SEMI VR 20K OHM |
| or | 4–222V–68914 | SEMI VR 22K OHM |
| SVR1121 | 4–222V–68910 | SEMI VR 4.7K OHM |
| or | 4–222V–69106 | SEMI VR 5K OHM |
| SVR1201 | 4–222V–69111 | SEMI VR 100K OHM |
| or | 4–222V–68918 | SEMI VR 100K OHM |
| SVR1202 | 4–222V–69104 | SEMI VR 2K OHM |
| or | 4–222V–68908 | SEMI VR 2.2K OHM |
|  |  | **(MISCELLANEOUS)** |
| DL1201 | 4–284V–19400 | DELAY LINE |
| F1101 | 4–953V–30100 | FILTER |
| F1201 | 4–228V–21100 | LC PACK |
| HIC1001 | 143–0–208V–02750 | HIC1001 BOARD ASSEMBLY |
| X1201 | 4–225V–18400 | CRYSTAL 4.433619MHZ |
| or | 4–225V–19000 | CRYSTAL 4.433619MHZ |

## VD-1 BOARD (AUDIO)
## NO.143-0-233V-51202

| Location | Part No. | Description |
|---|---|---|
|  |  | **(CAPACITORS)** |
| C2001 | 403 043 9106 | ELECT 47MF M 16V |
| C2002 | 403 043 9106 | ELECT 47MF M 16V |
| C2003 | 403 049 0008 | ELECT 1MF M 50V |
| C2004 | 403 075 4506 | CERAMIC 820PF K 50V |
| C2005 | 403 003 0600 | CERAMIC 0.018MF K 25V |
| C2006 | 403 048 6308 | ELECT 0.47MF M 50V |
| C2007 | 403 001 7007 | CERAMIC 3900PF K 16V |
| C2008 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2009 | 403 041 2109 | ELECT 47MF M 10V |
| C2010 | 403 041 8804 | ELECT 10MF M 16V |
| C2011 | 403 041 2109 | ELECT 47MF M 10V |
| C2012 | 403 049 0008 | ELECT 1MF M 50V |
| C2013 | 403 003 0600 | CERAMIC 0.018MF K 25V |
| C2014 | 403 049 0008 | ELECT 1MF M 50V |
| C2015 | 403 046 9905 | ELECT 4.7MF M 25V |
| C2016 | 403 041 8804 | ELECT 10MF M 16V |
| C2020 | 403 042 2405 | ELECT 100MF M 16V |
| C2021 | 403 003 4806 | CERAMIC 0.027MF K 25V |
| C2022 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C2023 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2024 | 403 001 6505 | CERAMIC 3300PF K 16V |
| C2025 | 403 071 6207 | CERAMIC 220PF K 50V |
| C2026 | 403 081 5207 | POLYPRO 0.027MF J 100V |
| C2051 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C2052 | 403 001 4006 | CERAMIC 1500PF M 16V |

| Location | Part No. | Description |
|---|---|---|
| C2053 | 403 068 9402 | CERAMIC 100PF K 50V |
| C2054 | 403 068 9402 | CERAMIC 100PF K 50V |
| C2055 | 403 070 7809 | CERAMIC 150PF K 50V |
| C2071 | 403 040 1707 | ELECT 22MF M 10V |
| C2072 | 403 049 0008 | ELECT 1MF M 50V |
| C2073 | 403 039 2104 | ELECT 47MF M 6.3V |
|  |  | **(DIODES)** |
| D2001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2071 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2072 | 407 050 4802 | ZENER DIODE GZA5.1Y |
| D2073 | 407 050 4802 | ZENER DIODE GZA5.1Y |
| D2075 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D2076 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
|  |  | **(INTEGRATED CIRCUIT)** |
| IC2001 | 409 018 9706 | IC LA7096 |
|  |  | **(COILS)** |
| L2001 | 4–253V–95801 | HF CHOKE 27MH |
| L2002 | 4–253V–76249 | HF CHOKE 10MH J |
| L2003 | 4–253V–76233 | HF CHOKE 560UH K |
| L2051 | 4–471V–11500 | CORE |
| L2052 | 4–471V–11500 | CORE |
| L2053 | 4–253V–97628 | HF CHOKE 560UH K |
| L2071 | 4–253V–74308 | HF CHOKE 1.0UH M |
|  |  | **(TRANSISTORS)** |
| Q2001 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
| Q2002 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
| Q2071 | 405 009 7003 | TR 2SB985-T |
| Q2072 | 405 006 6702 | TR 2SA984-F |
| Q2073 | 405 019 3804 | TR 2SC536-G-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
| Q2074 | 405 023 5009 | TR 2SD400-E-MP |
| or | 405 023 5306 | TR 2SD400-F-MP |
| Q2075 | 405 006 6702 | TR 2SA984-F |
| Q2076 | 405 006 6702 | TR 2SA984-F |
| or | 405 006 6504 | TR 2SA984-E |
| Q2077 | 405 006 6702 | TR 2SA984-F |
| or | 405 006 6504 | TR 2SA984-E |
| Q2078 | 405 019 1909 | TR 2SC536-E-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
|  |  | **(RESISTORS)** |
| R2001 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R2002 | 401 012 4404 | CARBON 100 JA 1/4W |
| R2003 | 401 016 5704 | CARBON 220K JA 1/4W |
| R2004 | 401 021 8905 | CARBON 6.2K JA 1/4W |
| R2005 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2006 | 401 016 4707 | CARBON 22K JA 1/4W |
| R2007 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R2008 | 401 022 7105 | CARBON 750 JA 1/4W |
| R2009 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R2010 | 401 013 5202 | CARBON 1.2K JA 1/4W |
| R2011 | 401 023 1607 | CARBON 820 JA 1/4W |
| R2012 | 401 016 6404 | CARBON 2.2M JA 1/4W |
| R2013 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2014 | 401 023 1607 | CARBON 820 JA 1/4W |
| R2015 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2016 | 401 105 3701 | CARBON 18K JA 1/4W |
| R2017 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2018 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2020 | 401 012 4404 | CARBON 100 JA 1/4W |
| R2021 | 401 019 2908 | CARBON 39K JA 1/4W |
| R2025 | 401 017 7509 | CARBON 3.9 JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R2026 | 401 018 4804 | CARBON 33K JA 1/4W |
| R2027 | 401 018 4804 | CARBON 33K JA 1/4W |
| R2071 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R2072 | 401 021 1807 | CARBON 560 JA 1/4W |
| R2073 | 401 016 2505 | CARBON 220 JA 1/4W |
| R2074 | 401 015 2605 | CARBON 1.8K JA 1/4W |
| R2075 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2076 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2077 | 401 018 7508 | CARBON 360 JA 1/4W |
| R2078 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2079 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2080 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2081 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2083 | 401 017 1705 | CARBON 2.7K JA 1/4W |
| R2084 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2086 | 401 012 6903 | CARBON 10K JA 1/4W |
| R2087 | 401 022 4005 | CARBON 68K JA 1/4W |
| R2088 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R2089 | 401 016 4707 | CARBON 22K JA 1/4W |
| R2091 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2092 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2093 | 401 015 0502 | CARBON 18 JA 1/4W |
| R2094 | 401 015 0502 | CARBON 18 JA 1/4W |
|  |  | **(SEMI VARIABLE RESISTORS)** |
| SVR2001 | 4–222V–68918 | SEMI VR 100K OHM |
| or | 4–222V–69011 | SEMI VR 100K OHM |
| or | 4–222V–69111 | SEMI VR 100K OHM |
| SVR2002 | 4–222V–68912 | SEMI VR 10K OHM |
| or | 4–222V–69007 | SEMI VR 10K OHM |
| or | 4–222V–69107 | SEMI VR 10K OHM |
|  |  | **(TRANSFORMER)** |
| T2001 | 4–258V–18600 | OSC COIL |
|  |  | **(MISCELLANEOUS)** |
| F2051 | 4–953V–26113 | FILTER |
| F2052 | 4–953V–26111 | FILTER |
| F2071 | 4–234V–18309 | FUSE 315MA 250V |

## VD-1 BOARD (TUNER)
## NO.143-0-233V-51202

| Location | Part No. | Description |
|---|---|---|
|  |  | **(CAPACITORS)** |
| C6080 | 403 046 9905 | ELECT 4.7MF M 25V |
| C6081 | 403 067 5603 | MT-COMPO 0.1MF J 50V |
| or | 403 065 8002 | MT-POLYEST 0.1MF J 63V |
| C6082 | 403 049 0008 | ELECT 1MF M 50V |
| C6083 | 403 046 9905 | ELECT 4.7MF M 25V |
| C6084 | 403 048 6308 | ELECT 0.47MF M 50V |
| C6085 | 403 038 1603 | ELECT 100MF M 6.3V |
| C6086 | 403 115 1007 | MT-POLYEST 0.33MF J 63V |
| or | 403 067 7300 | MT-COMPO 0.33MF J 50V |
| C6087 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
|  |  | **(DIODES)** |
| D6082 | 407 051 6706 | ZENER DIODE GZS5.1Y |
| or | 407 051 6805 | ZENER DIODE GZS5.1Z-BT |
| or | 407 053 6308 | ZENER DIODE MTZ5.1B-T-77 |
| or | 407 053 6407 | ZENER DIODE MTZ5.1C |
| D6083 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
|  |  | **(COIL)** |
| L6084 | 4–253V–74308 | HF CHOKE 1.0UH M |
|  |  | **(RESISTORS)** |
| R6080 | 401 012 5609 | CARBON 1K JA 1/4W |
| R6084 | 401 017 8506 | CARBON 300 JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R6085 | 401 020 0702 | CARBON 470 JA 1/4W |
| R6087 | 401 012 8006 | CARBON 100K JA 1/4W |
| R6091 | 401 017 0708 | CARBON 270 JA 1/4W |

## HIC1001 BOARD (VIDEO)
## NO.143-0-208V-02750

| Location | Part No. | Description |
|---|---|---|
| | | (CAPACITORS) |
| C1901 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1902 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1903 | 403 068 0409 | CERAMIC 0.1MF Z 25V |
| C1904 | 403 074 3104 | CERAMIC 0.047MF Z 50V |
| C1905 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1906 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1907 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1908 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| | | (DIODES) |
| D1901 | 407 003 3609 | DIODE DAN202K-T-96 |
| D1902 | 407 003 4507 | DIODE DAP202K-T-96 |
| D1903 | 407 003 4507 | DIODE DAP202K-T-96 |
| | | (TRANSISTORS) |
| Q1901 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1902 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1903 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1904 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1905 | 405 002 0308 | TR 2SA1037K-T96-R |
| or | 405 003 1809 | TR 2SA1252-D4-TB |
| Q1906 | 405 002 0308 | TR 2SA1037K-T96-R |
| or | 405 003 1809 | TR 2SA1252-D4-TB |
| Q1907 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1908 | 405 014 4509 | TR 2SC2412K-T96-R |
| Q1909 | 405 014 4509 | TR 2SC2412K-T96-R |
| | | (RESISTORS) |
| R1901 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1902 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1903 | 401 037 8609 | MT-GLAZE 1.6K JA 1/10W |
| R1904 | 401 037 9309 | MT-GLAZE 18K JA 1/10W |
| R1905 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R1906 | 401 037 8005 | MT-GLAZE 15K JA 1/10W |
| R1907 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1908 | 401 038 3603 | MT-GLAZE 3.3K JA 1/10W |
| R1909 | 401 037 6704 | MT-GLAZE 1.2K JA 1/10W |
| R1910 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1911 | 401 038 3603 | MT-GLAZE 3.3K JA 1/10W |
| R1912 | 401 037 9309 | MT-GLAZE 18K JA 1/10W |
| R1913 | 401 038 9704 | MT-GLAZE 7.5K JA 1/10W |
| R1914 | 401 037 6704 | MT-GLAZE 1.2K JA 1/10W |
| R1915 | 401 037 5400 | MT-GLAZE 1K JA 1/10W |
| R1916 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1917 | 401 037 5707 | MT-GLAZE 100K JA 1/10W |
| R1918 | 401 038 6604 | MT-GLAZE 470K JA 1/10W |
| R1919 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R1920 | 401 037 6803 | MT-GLAZE 12K JA 1/10W |
| R1921 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R1922 | 401 038 0800 | MT-GLAZE 22K JA 1/10W |
| R1923 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1924 | 401 039 0403 | MT-GLAZE 8.2K JA 1/10W |
| R1925 | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W |

## VP-1 BOARD (VIDEO PRE-AMP)
## NO.143-0-233V-43801

| Location | Part No. | Description |
|---|---|---|
| | | (CAPACITORS) |
| C1602 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1603 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1604 | 403 043 9700 | ELECT 47MF M 16V |
| C1605 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1606 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1607 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1609 | 403 069 1702 | CERAMIC 1000PF K 50V |
| C1610 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1611 | 403 114 3101 | CERAMIC 1MF Z 16V |
| C1612 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1613 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1614 | 403 020 0508 | CERAMIC 27PF J 50V |
| C1615 | 403 018 0602 | CERAMIC 22PF J 50V |
| C1616 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1617 | 403 068 0409 | CERAMIC 0.1MF Z 25V |
| C1618 | 403 039 3101 | ELECT 47MF M 6.3V |
| C1621 | 403 134 7400 | CERAMIC 1MF Z 16V |
| C1622 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1623 | 403 018 0602 | CERAMIC 22PF J 50V |
| C1624 | 403 069 1702 | CERAMIC 1000PF K 50V |
| C1632 | 403 069 5601 | CERAMIC 0.01MF K 50V |
| C1641 | 403 027 1201 | CERAMIC 5PF C 50V |
| C1642 | 403 018 7502 | CERAMIC 220PF J 50V |
| C1643 | 403 014 3508 | CERAMIC 18PF J 50V |
| C1644 | 403 022 8304 | CERAMIC 33PF J 50V |
| C1645 | 403 114 3101 | CERAMIC 1MF Z 16V |
| | | (INTEGRATED CIRCUIT) |
| IC1601 | 409 118 8401 | IC AN3330K |
| | | (COILS) |
| L1602 | 4-253V-76132 | HF CHOKE 100UH J |
| L1603 | 4-253V-76132 | HF CHOKE 100UH J |
| L1641 | 4-253V-76125 | HF CHOKE 27UH J |
| L1642 | 4-253V-75016 | HF CHOKE 4.7UH K |
| L1643 | 4-253V-76123 | HF CHOKE 18UH J |
| | | (TRANSISTORS) |
| Q1640 | 405 015 9701 | TR 2SC2814-F4-TB |
| Q1641 | 405 015 9701 | TR 2SC2814-F4-TB |
| | | (RESISTORS) |
| R1601 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1603 | 401 037 7909 | MT-GLAZE 1.5K JA 1/10W |
| R1605 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1606 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1607 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1608 | 401 036 7207 | MT-GLAZE 4.7 JA 1/8W |
| R1609 | 401 035 4900 | MT-GLAZE 1K JA 1/8W |
| R1612 | 401 037 7701 | MT-GLAZE 15 JA 1/10W |
| R1613 | 401 037 7701 | MT-GLAZE 15 JA 1/10W |
| R1621 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1641 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R1642 | 401 038 6307 | MT-GLAZE 470 JA 1/10W |
| R1643 | 401 038 7601 | MT-GLAZE 560 JA 1/10W |
| R1644 | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W |
| R1645 | 401 037 7909 | MT-GLAZE 1.5K JA 1/10W |
| R1646 | 401 038 0701 | MT-GLAZE 2.2K JA 1/10W |
| R1651 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1652 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1653 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1654 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1655 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1656 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1657 | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W |
| R1658 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1659 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |
| R1660 | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W |

## SY-1 BOARD (SYSTEM CONTROL)
## NO.143-0-233V-53600

| Location | Part No. | Description |
|---|---|---|
|  | 143-2-464T-07700 | FIXER,SY-1 BOARD |
|  |  | **(COMPOSITE)** |
| B3001 | 405 018 2501 | TR 2SC3399 |
| B3002 | 405 018 2501 | TR 2SC3399 |
|  |  | **(CAPACITORS)** |
| C3001 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3002 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3003 | 403 048 6308 | ELECT 0.47MF M 50V |
| C3004 | 403 022 2005 | CERAMIC 30PF J 50V |
| C3006 | 403 038 1603 | ELECT 100MF M 6.3V |
| C3007 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3008 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3009 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3011 | 403 049 9803 | ELECT 2.2MF M 50V |
| C3012 | 403 085 7405 | NP-ELECT 10MF M 25V |
| C3013 | 403 002 2506 | CERAMIC 0.01MF M 25V |
| C3014 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3015 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3016 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3017 | 403 047 0604 | ELECT 4.7MF M 25V |
| C3018 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3019 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3020 | 403 022 0902 | CERAMIC 30PF J 50V |
| C3021 | 403 022 0902 | CERAMIC 30PF J 50V |
| C3022 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3023 | 403 068 8801 | CERAMIC 100PF J 50V |
| C3024 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3025 | 403 001 3108 | CERAMIC 0.1MF Z 16V |
| C3026 | 403 038 1603 | ELECT 100MF M 6.3V |
| C3027 | 403 069 0705 | CERAMIC 1000PF K 50V |
| C3028 | 403 071 6207 | CERAMIC 220PF K 50V |
| C3029 | 403 071 6207 | CERAMIC 220PF K 50V |
|  |  | **(DIODES)** |
| D3002 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D3003 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D3004 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D3011 | 407 050 3805 | ZENER DIODE GZA4.7Z |
| or | 407 059 0706 | ZENER DIODE 05Z4.7Z |
| D3012 | 407 050 6202 | ZENER DIODE GZA6.2Y |
| or | 407 059 1802 | ZENER DIODE 05Z6.2Y |
| D3013 | 407 050 7902 | ZENER DIODE GZA9.1Z |
|  |  | **(INTEGRATED CIRCUITS)** |
| IC3001 | 410 030 7502 | IC HD404418SM20 |
| or | 410 030 7601 | IC HD4074418S20 |
| IC3002 | 410 028 3301 | IC TMS70C20-28C71022 |
| IC3003 | 409 114 4803 | IC LB1641 |
| or | 409 111 9405 | IC BA6209N |
| IC3004 | 409 018 3902 | IC LA6393D |
| or | 409 057 3406 | IC UPC393C |
|  |  | **(TRANSISTORS)** |
| Q3001 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3002 | 405 019 2807 | TR 2SC536-F-SPA |
| Q3003 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3004 | 405 019 2005 | TR 2SC536-E-SPA |
| or | 405 019 2807 | TR 2SC536-F-SPA |
| Q3005 | 405 006 6504 | TR 2SA984-E |
| or | 405 006 7006 | TR 2SA984K-E |
|  |  | **(RESISTORS)** |
| R3001 | 401 012 9201 | CARBON 1M JA 1/4W |
| R3002 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3003 | 401 012 4404 | CARBON 100 JA 1/4W |
| R3004 | 401 018 5702 | CARBON 330K JA 1/4W |
| R3005 | 401 014 6000 | CARBON 150K JA 1/4W |
| R3006 | 401 022 7105 | CARBON 750 JA 1/4W |
| R3007 | 401 019 8603 | CARBON 430K JA 1/4W |
| R3008 | 401 019 2908 | CARBON 39K JA 1/4W |
| R3009 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3010 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3011 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3012 | 401 020 2805 | CARBON 47K JA 1/4W |
| R3013 | 401 017 2702 | CARBON 27K JA 1/4W |
| R3014 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3015 | 401 022 4005 | CARBON 68K JA 1/4W |
| R3016 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R3017 | 401 020 2805 | CARBON 47K JA 1/4W |
| R3018 | 401 017 2702 | CARBON 27K JA 1/4W |
| R3019 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3020 | 401 022 4005 | CARBON 68K JA 1/4W |
| R3021 | 401 021 2903 | CARBON 5.6K JA 1/4W |
| R3022 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3023 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3024 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3025 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3026 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3027 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3028 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3029 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R3030 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3031 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3032 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3033 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3034 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3035 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3036 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3037 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3038 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3039 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3040 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3041 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3043 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3044 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3045 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3046 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3047 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3048 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3049 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3050 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3051 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3052 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3053 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3054 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3055 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3056 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3057 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3059 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3060 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3061 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3062 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3063 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3064 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3065 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3066 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3070 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3071 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3072 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3073 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3074 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3075 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3076 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3077 | 401 012 5708 | CARBON 1K JA 1/4W |
| R3078 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3079 | 401 018 4804 | CARBON 33K JA 1/4W |
| R3080 | 401 020 2904 | CARBON 47K JA 1/4W |
| R3081 | 401 018 4903 | CARBON 33K JA 1/4W |

| Location | Part No. | Description |
|---|---|---|
| R3083 | 401 017 9701 | CARBON 30K JA 1/4W |
| R3084 | 401 017 9701 | CARBON 30K JA 1/4W |
| R3085 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R3086 | 401 013 7206 | CARBON 120K JA 1/4W |
| R3087 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3088 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R3089 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3090 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3091 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3092 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3093 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3094 | 401 012 5609 | CARBON 1K JA 1/4W |
| R3095 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3104 | 401 022 3008 | CARBON 6.8K JA 1/4W |
| R3105 | 401 016 4707 | CARBON 22K JA 1/4W |
| R3107 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3108 | 401 019 1802 | CARBON 3.9K JA 1/4W |
| R3110 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3111 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3112 | 401 012 9201 | CARBON 1M JA 1/4W |
| R3114 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3115 | 401 012 6903 | CARBON 10K JA 1/4W |
| R3151 | 402 034 7602 | FUSIBLE RES 3.3 JA 1/2W |
| or | 402 036 3404 | FUSIBLE RES 3.3 JA 1/2W |
| | | **(MISCELLANEOUS)** |
| X3001 | 4–266V–02900 | CERAMIC RESONATOR 8MHZ |
| or | 4–266V–03200 | CERAMIC RESONATOR 8MHZ |
| X3002 | 4–266V–02800 | CERAMIC RESONATOR 5MHZ |
| or | 4–266V–03100 | CERAMIC RESONATOR 5MHZ |

**SY-1 BOARD (SERVO)**
**NO.143-0-233V-53600**

| Location | Part No. | Description |
|---|---|---|
| | | **(COMPOSITE)** |
| B4001 | 405 063 9708 | TR DTC144EL-TL2 |
| B4002 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |
| or | 405 000 6104 | TR DTC144ES |
| B4003 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |
| or | 405 000 6104 | TR DTC144ES |
| B4004 | 405 003 7603 | TR 2SA1345 |
| B4005 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |
| or | 405 000 6104 | TR DTC144ES |
| | | **(CAPACITORS)** |
| C4001 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C4002 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C4003 | 403 044 8504 | ELECT 10MF M 25V |
| C4004 | 403 062 6506 | POLYESTER 0.056MF J 50V |
| C4005 | 403 050 0509 | ELECT 2.2MF M 50V |
| C4006 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4007 | 403 044 7002 | ELECT 10MF M 25V |
| C4008 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4009 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C4010 | 403 001 8806 | CERAMIC 6800PF K 16V |
| C4011 | 403 058 9504 | POLYESTER 0.018MF J 50V |
| C4012 | 403 058 9504 | POLYESTER 0.018MF J 50V |
| C4013 | 403 058 9504 | POLYESTER 0.018MF J 50V |
| C4014 | 403 071 6207 | CERAMIC 220PF K 50V |
| C4015 | 403 062 6506 | POLYESTER 0.056MF J 50V |
| C4016 | 403 049 0800 | ELECT 1MF M 50V |
| C4017 | 403 049 0800 | ELECT 1MF M 50V |
| C4018 | 403 068 9402 | CERAMIC 100PF K 50V |
| C4019 | 403 043 9601 | ELECT 47MF M 16V |
| C4020 | 403 063 1302 | POLYESTER 0.068MF J 50V |
| C4021 | 403 058 9504 | POLYESTER 0.018MF J 50V |
| C4022 | 403 068 9402 | CERAMIC 100PF K 50V |
| C4023 | 403 049 0800 | ELECT 1MF M 50V |
| C4024 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4025 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4026 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4027 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C4028 | 403 062 4502 | POLYESTER 5600PF J 50V |
| C4029 | 403 004 0500 | CERAMIC 0.047MF K 25V |
| C4030 | 403 060 7802 | POLYESTER 0.033MF J 50V |
| C4031 | 403 085 4305 | NP-ELECT 10MF M 16V |
| C4032 | 403 003 3700 | CERAMIC 0.022MF Z 25V |
| C4033 | 403 038 2006 | ELECT 100MF M 6.3V |
| or | 403 038 2006 | ELECT 100MF M 6.3V |
| C4034 | 403 001 6505 | CERAMIC 3300PF K 16V |
| or | 403 072 9405 | CERAMIC 3300PF K 50V |
| C4035 | 403 041 9405 | ELECT 10MF M 16V |
| C4036 | 403 001 7403 | CERAMIC 4700PF K 16V |
| C4037 | 403 061 9706 | POLYESTER 0.047MF J 50V |
| C4038 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4039 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4040 | 403 085 9102 | NP-ELECT 3.3MF M 25V |
| C4041 | 403 003 2802 | CERAMIC 0.022MF K 25V |
| C4042 | 403 049 0800 | ELECT 1MF M 50V |
| C4043 | 403 001 1609 | CERAMIC 0.01MF K 16V |
| C4044 | 403 068 9402 | CERAMIC 100PF K 50V |
| C4045 | 403 048 2508 | ELECT 0.22MF M 50V |
| C4046 | 403 039 2609 | ELECT 47MF M 6.3V |
| C4047 | 403 059 5505 | POLYESTER 0.022MF J 50V |
| C4048 | 403 039 2609 | ELECT 47MF M 6.3V |
| C4049 | 403 004 0500 | CERAMIC 0.047MF K 25V |
| C4050 | 403 042 0104 | ELECT 10MF M 16V |
| C4051 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C4052 | 403 039 2609 | ELECT 47MF M 6.3V |
| C4053 | 403 057 2001 | POLYESTER 0.1MF J 50V |
| C4054 | 403 041 9405 | ELECT 10MF M 16V |
| C4055 | 403 003 2802 | CERAMIC 0.022MF K 25V |
| C4057 | 403 135 0509 | NP-ELECT 1MF M 50V |
| or | 403 086 3000 | NP-ELECT 1MF M 50V |
| or | 403 086 2904 | NP-ELECT 1MF M 50V |
| or | 403 086 2805 | NP-ELECT 1MF M 50V |
| | | **(DIODES)** |
| D4001 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4005 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4006 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4007 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4008 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4009 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4010 | 407 012 4405 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4011 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4012 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4013 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4014 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4016 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4017 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4018 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4019 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| D4020 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |

| Location | Part No. | Description |
|---|---|---|
| | | **(INTEGRATED CIRCUITS)** |
| IC4001 | 409 125 8807 | IC LC7413-8034 |
| IC4002 | 409 114 4209 | IC LA7117 |
| IC4003 | 409 003 5508 | IC BA718 |
| IC4004 | 409 051 3006 | IC TC4053BP |
| IC4005 | 409 002 2904 | IC BA236 |
| | | **(TRANSISTORS)** |
| Q4002 | 405 019 2708 | TR 2SC536-F-NP |
| Q4005 | 405 038 0501 | TR 2SK404-E |
| Q4006 | 405 019 1909 | TR 2SC536-E-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
| Q4007 | 405 019 1909 | TR 2SC536-E-NP |
| or | 405 019 2708 | TR 2SC536-F-NP |
| Q4008 | 405 006 1103 | TR 2SA933-Q |
| or | 405 006 1202 | TR 2SA933-R |
| | | **(RESISTORS)** |
| R4001 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R4002 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4003 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4004 | 401 022 4005 | CARBON 68K JA 1/4W |
| R4005 | 401 022 4005 | CARBON 68K JA 1/4W |
| R4006 | 401 020 3802 | CARBON 470K JA 1/4W |
| R4007 | 401 018 5702 | CARBON 330K JA 1/4W |
| R4008 | 401 021 4006 | CARBON 56K JA 1/4W |
| R4009 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4010 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4011 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4012 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4013 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4014 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4015 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4016 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4017 | 401 014 6000 | CARBON 150K JA 1/4W |
| R4018 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4019 | 401 020 3802 | CARBON 470K JA 1/4W |
| R4020 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4021 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4022 | 401 017 2702 | CARBON 27K JA 1/4W |
| R4023 | 401 017 2702 | CARBON 27K JA 1/4W |
| R4024 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4025 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4026 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4027 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4028 | 401 012 4404 | CARBON 100 JA 1/4W |
| R4029 | 401 012 5708 | CARBON 1K JA 1/4W |
| R4030 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4031 | 401 016 3809 | CARBON 2.2K JA 1/4W |
| R4032 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4033 | 401 021 4907 | CARBON 560K JA 1/4W |
| R4034 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4035 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4036 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4038 | 401 017 3709 | CARBON 270K JA 1/4W |
| R4039 | 401 014 6000 | CARBON 150K JA 1/4W |
| R4040 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4041 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4042 | 401 087 4101 | MT-FILM 4.7K FD 1/6W |
| R4043 | 401 087 4101 | MT-FILM 4.7K FD 1/6W |
| R4044 | 401 105 4708 | CARBON 180K JA 1/4W |
| R4045 | 401 021 4907 | CARBON 560K JA 1/4W |
| R4046 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R4047 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4048 | 401 016 5704 | CARBON 220K JA 1/4W |
| R4049 | 401 018 2701 | CARBON 330 JA 1/4W |
| R4050 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4051 | 401 012 5708 | CARBON 1K JA 1/4W |
| R4052 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4053 | 401 019 2908 | CARBON 39K JA 1/4W |
| R4054 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4055 | 401 023 7807 | CARBON 91K JA 1/4W |
| R4056 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4057 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4059 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4060 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4061 | 401 012 8006 | CARBON 100K JA 1/4W |
| R4064 | 401 020 3802 | CARBON 470K JA 1/4W |
| R4065 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4066 | 401 018 4804 | CARBON 33K JA 1/4W |
| R4067 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4068 | 401 018 3807 | CARBON 3.3K JA 1/4W |
| R4070 | 401 020 1907 | CARBON 4.7K JA 1/4W |
| R4071 | 401 014 5102 | CARBON 15K JA 1/4W |
| R4072 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4073 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4074 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4075 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4076 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4077 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4078 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4079 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4080 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4081 | 401 017 3709 | CARBON 270K JA 1/4W |
| R4082 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4083 | 401 016 8705 | CARBON 240K JA 1/4W |
| R4084 | 401 018 3708 | CARBON 3.3K JA 1/4W |
| R4086 | 401 016 8705 | CARBON 240K JA 1/4W |
| R4087 | 401 022 8508 | CARBON 750K JA 1/4W |
| R4088 | 401 018 0202 | CARBON 300K JA 1/4W |
| R4089 | 401 012 7009 | CARBON 10K JA 1/4W |
| R4090 | 401 018 5702 | CARBON 330K JA 1/4W |
| R4091 | 401 016 3700 | CARBON 2.2K JA 1/4W |
| R4092 | 401 016 4707 | CARBON 22K JA 1/4W |
| R4093 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4094 | 401 012 4404 | CARBON 100 JA 1/4W |
| R4095 | 401 012 5609 | CARBON 1K JA 1/4W |
| R4096 | 401 012 6903 | CARBON 10K JA 1/4W |
| or | 401 012 7009 | CARBON 10K JA 1/4W |
| R4097 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4098 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4099 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4100 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4101 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4102 | 401 012 9201 | CARBON 1M JA 1/4W |
| R4103 | 401 018 5702 | CARBON 330K JA 1/4W |
| R4108 | 401 012 9201 | CARBON 1M JA 1/4W |
| R4109 | 401 012 9201 | CARBON 1M JA 1/4W |
| R4112 | 401 012 6903 | CARBON 10K JA 1/4W |
| | | **(SEMI VARIABLE RESISTORS)** |
| SVR4001 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| SVR4002 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| SVR4003 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| SVR4005 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| SVR4006 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| SVR4007 | 4–222V–65621 | SEMI VR 220K OHM |
| or | 4–222V–68313 | SEMI VR 200K OHM |
| | | **(VARIABLE RESISTOR)** |
| VR4004 | 4–222V–29600 | VR 100K OHM |

## SV-3 BOARD (SERVO)
## NO.143-0-233V-62400

| Location | Part No. | Description |
|---|---|---|
| | | **(COMPOSITE)** |
| B4301 | 405 018 2501 | TR 2SC3399 |
| or | 405 001 0408 | TR RN1204 |

| Location | Part No. | Description |
|---|---|---|
| B4301 | 405 000 6104 | TR DTC144ES |
| | | **(CAPACITORS)** |
| C4301 | 403 057 2001 | POLYESTER 0.1MF J 50V |
| C4302 | 403 057 2001 | POLYESTER 0.1MF J 50V |
| | | **(DIODES)** |
| D4301 | 407 012 4406 | DIODE 1SS133 |
| or | 407 007 9904 | DIODE GMA01 |
| | | **(INTEGRATED CIRCUIT)** |
| IC4301 | 409 002 2607 | IC BA226 |
| | | **(RESISTORS)** |
| R4301 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4302 | 401 012 6903 | CARBON 10K JA 1/4W |
| R4303 | 401 017 3709 | CARBON 270K JA 1/4W |
| R4304 | 401 017 3709 | CARBON 270K JA 1/4W |
| R4305 | 401 017 9701 | CARBON 30K JA 1/4W |

## PW-1 BOARD (POWER SUPPLY)
## NO.143-0-233V-43594

| Location | Part No. | Description |
|---|---|---|
| | 143-2-383T-03100 | FUSE HOLDER |
| | 143-2-368T-11300 | HEAT SINK |
| | | **(CAPACITORS)** |
| C5001 | 403 050 5504 | ELECT 2200MF M 50V |
| C5002 | 403 054 6002 | ELECT 100MF M 100V |
| C5003 | 403 054 9409 | ELECT 47MF M 100V |
| C5004 | 403 049 0008 | ELECT 1MF M 50V |
| C5005 | 403 039 6508 | ELECT 100MF M 10V |
| C5006 | 403 039 6508 | ELECT 100MF M 10V |
| C5007 | 403 049 0008 | ELECT 1MF M 50V |
| C5008 | 403 043 1902 | ELECT 2200MF M 16V |
| C5009 | 403 043 9106 | ELECT 47MF M 16V |
| C5011 | 403 049 0008 | ELECT 1MF M 50V |
| C5012 | 403 049 4204 | ELECT 10MF M 50V |
| C5014 | 403 057 2902 | POLYESTER 0.1MF K 50V |
| or | 403 057 3503 | POLYESTER 0.1MF K 50V |
| C5015 | 403 102 8408 | MT-POLYEST 0.1MF K 100V |
| or | 403 121 6706 | MT-POLYEST 0.1MF J 100V |
| C5101 | ⚠404 031 1201 | MT-COMPO 4700PF M 250V |
| | | **(DIODES)** |
| D5001 | 407 081 2402 | DIODE DSA12TC-KC6 |
| D5002 | 407 081 2402 | DIODE DSA12TC-KC6 |
| D5003 | 407 081 2402 | DIODE DSA12TC-KC6 |
| D5004 | 407 081 2402 | DIODE DSA12TC-KC6 |
| D5005 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5006 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5007 | 407 004 9709 | DIODE DSK10C |
| or | 407 005 8701 | DIODE ERA15-02A |
| D5009 | 407 050 9104 | ZENER DIODE GZB16C |
| D5010 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |
| D5011 | 407 065 7904 | ZENER DIODE GZS12X |
| or | 407 053 3109 | ZENER DIODE MTZ12A |
| D5012 | 407 051 6003 | ZENER DIODE GZS33X |
| or | 407 078 1104 | ZENER DIODE MTZ33A |
| D5013 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |
| D5014 | 407 051 6706 | ZENER DIODE GZS5.1Y |
| or | 407 053 6407 | ZENER DIODE MTZ5.1C |
| D5015 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4208 | DIODE 1SS131 |

| Location | Part No. | Description |
|---|---|---|
| | | **(INTEGRATED CIRCUIT)** |
| IC5001 | 409 114 5206 | IC STK7226 |
| | | **(COILS)** |
| L5001 | 4-252V-12100 | LF CHOKE 200UH |
| or | 4-252V-12200 | LF CHOKE 200UH |
| or | 4-252V-13500 | LF CHOKE 185UH |
| L5002 | 4-471V-12200 | CORE |
| L5003 | 4-471V-12200 | CORE |
| L5101 | ⚠ 4-953V-26200 | FILTER |
| | | **(TRANSISTORS)** |
| Q5002 | 405 006 7204 | TR 2SA984K-F |
| or | 405 006 7006 | TR 2SA984K-E |
| Q5003 | 405 007 5308 | TR 2SB560-F-MP |
| or | 405 007 5100 | TR 2SB560-E-MP |
| Q5004 | 405 043 6000 | TR 2SC3807 |
| Q5005 | 405 019 2708 | TR 2SC536-F-NP |
| or | 405 019 1909 | TR 2SC536-E-NP |
| | | **(RESISTORS)** |
| R5001 | ⚠402 003 8906 | FUSIBLE RES 2.2 JA 1/2W |
| R5002 | 401 016 7906 | CARBON 2.4K JA 1/4W |
| R5003 | 401 016 7906 | CARBON 2.4K JA 1/4W |
| R5004 | 401 016 7906 | CARBON 2.4K JA 1/4W |
| R5005 | 401 014 5102 | CARBON 15K JA 1/4W |
| R5006 | 401 019 7705 | CARBON 4.3K JA 1/4W |
| R5007 | 401 019 7705 | CARBON 4.3K JA 1/4W |
| R5008 | ⚠402 023 2106 | FUSIBLE RES 47 JA 1/4W |
| R5009 | 401 018 8307 | CARBON 36K JA 1/4W |
| R5010 | 401 014 2804 | CARBON 150 JA 1/4W |
| R5011 | 401 014 2804 | CARBON 150 JA 1/4W |
| R5012 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5013 | 401 018 7904 | CARBON 3.6K JA 1/4W |
| R5014 | 401 014 8509 | CARBON 1.6K JA 1/4W |
| R5015 | 401 014 4006 | CARBON 1.5K JA 1/4W |
| R5016 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5017 | 401 012 6903 | CARBON 10K JA 1/4W |
| R5018 | 401 023 2703 | CARBON 8.2K JA 1/4W |
| | | **(MISCELLANEOUS)** |
| F5001 | ⚠ 4-234V-18313 | FUSE 800MA 250V |
| F5101 | ⚠ 4-234V-17606 | FUSE 400MA |

## TN-1 BOARD (TUNER IF)
## NO.143-0-233V-36222

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C6009 | 403 049 1005 | ELECT 1MF M 50V |
| C6012 | 403 053 9707 | ELECT 4.7MF M 35V |
| C6014 | 403 047 9201 | ELECT 0.1MF M 50V |
| C6016 | 403 043 9700 | ELECT 47MF M 16V |
| C6024 | 403 041 9603 | ELECT 10MF M 16V |
| C6025 | 403 053 9707 | ELECT 4.7MF M 35V |
| C6026 | 403 058 2406 | POLYESTER 0.015MF J 50V |
| | | **(DIODE)** |
| D6001 | 407 012 4406 | DIODE 1SS133 |
| | | **(INTEGRATED CIRCUIT)** |
| IC6001 | 409 019 3307 | IC LA7530N |
| | | **(COILS)** |
| L6001 | 4-253V-78600 | HF CHOKE 3.9UH |
| L6002 | 4-253V-78700 | HF CHOKE 1.2UH |
| L6003 | 4-253V-74421 | HF CHOKE 15UH |
| L6004 | 4-253V-74426 | HF CHOKE 33UH |

| Location | Part No. | Description |
|---|---|---|
| | | **(TRANSISTOR)** |
| Q6004 | 405 011 8302 | TR 2SC1740S.E |
| | | **(RESISTOR)** |
| R6022 | 402 004 1203 | FUSIBLE RES 22JA 1/4W |
| | | **(TRANSFORMERS)** |
| T6001 | 4–256V–35000 | IFT |
| T6002 | 4–256V–35100 | IFT |
| T6003 | 4–256V–35200 | IFT |
| | | **(VARIABLE RESISTOR)** |
| VR6001 | 4–222V–68912 | 10K OHM |
| | | **(MISCELLANEOUS)** |
| F6001 | 4–953V–32000 | FILTER |
| F6002 | 4–953V–23900 | FILTER |
| F6003 | 4–953V–08800 | FILTER |
| F6004 | 4–953V–02600 | FILTER |

## TN-2 BOARD (TUNING CONTROL)
## NO.143-0-233V-49221

| Location | Part No. | Description |
|---|---|---|
| | 401 037 5004 | MT-GLAZE 0.000 ZA 1/10W, J6101-6112 |
| | 401 035 4108 | MT-GLAZE 0.000 ZA 1/8W,J6113-6134 |
| | | **(COMPOSITE)** |
| B6101 | 4–958V–00700 | R-PACK 10 OHMX9 |
| | | **(CAPACITORS)** |
| C6102 | 403 041 9405 | ELECT 10MF M 16V |
| C6103 | 403 041 9405 | ELECT 10MF M 16V |
| C6104 | 403 048 4809 | ELECT 0.33MF M 50V |
| C6106 | 403 049 4808 | ELECT 10MF M 50V |
| C6107 | 403 038 6707 | ELECT 220MF M 6.3V |
| C6108 | 403 050 3302 | ELECT 22MF M 50V |
| C6109 | 403 050 0509 | ELECT 2.2MF M 50V |
| C6110 | 403 009 5708 | CERAMIC 100PF J 50V |
| C6111 | 403 009 5708 | CERAMIC 100PF J 50V |
| C6112 | 403 069 1702 | CERAMIC 1000PF K 50V |
| C6113 | 403 071 6504 | CERAMIC 220PF K 50V |
| C6115 | 403 069 0705 | CERAMIC 1000PF K 50V |
| C6116 | 403 069 1702 | CERAMIC 1000PF K 50V |
| C6117 | 403 069 1702 | CERAMIC 1000PF K 50V |
| C6118 | 403 018 0503 | CERAMIC 22PF J 50V |
| C6119 | 403 018 0503 | CERAMIC 22PF J 50V |
| C6120 | 403 067 6501 | MT-COMPO 0.18MF J 50V |
| C6121 | 403 073 1200 | CERAMIC 0.033MF K 50V |
| C6122 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6125 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6126 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6127 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6128 | 403 069 9500 | CERAMIC 0.01MF Z 50V |
| C6129 | 403 069 1207 | CERAMIC 1000PF K 50V |
| | | **(DIODES)** |
| D6101 | 407 004 8009 | DIODE DSB015-TB |
| D6102 | 407 004 8009 | DIODE DSB015-TB |
| | | **(INTEGRATED CIRCUITS)** |
| IC6101 | 410 028 7804 | IC TMP47C231AN4973 |
| IC6102 | 409 119 0602 | IC M58655P |
| IC6103 | 409 114 4308 | IC LA7214 |
| IC6104 | 409 119 2408 | IC TD6358N |
| IC6105 | 409 057 5103 | IC UPC574J |
| or | 409 026 8203 | IC L5631 |
| | | **(COILS)** |
| L6101 | 4–253V–74320 | HF CHOKE 10UH K |
| L6102 | 4–253V–74320 | HF CHOKE 10UH K |
| | | **(TRANSISTORS)** |
| Q6101 | 405 068 0007 | TR 2SA1362-GR-TE85L |
| Q6102 | 405 065 5708 | TR FMS1-T98 |
| Q6103 | 405 065 5708 | TR FMS1-T98 |
| Q6105 | 405 044 6009 | TR 2SC3361-S5-TB |
| | | **(RESISTORS)** |
| R6101 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6102 | 401 035 4900 | MT-GLAZE 1K JA 1/8W |
| R6103 | 401 038 6406 | MT-GLAZE 4.7K JA 1/10W |
| R6104 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6105 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6106 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6107 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6108 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6109 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| R6110 | 401 038 3504 | MT-GLAZE 330 JA 1/10W |
| R6111 | 401 038 3801 | MT-GLAZE 330K JA 1/10W |
| R6112 | 401 038 2309 | MT-GLAZE 270K JA 1/10W |
| R6113 | 401 037 6209 | MT-GLAZE 11K JA 1/10W |
| R6114 | 401 037 8005 | MT-GLAZE 15K JA 1/10W |
| R6115 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R6116 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R6117 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R6118 | 401 038 6505 | MT-GLAZE 47K JA 1/10W |
| R6122 | 401 038 6604 | MT-GLAZE 470K JA 1/10W |
| R6123 | 401 038 5409 | MT-GLAZE 390K JA 1/10W |
| R6124 | 401 035 4900 | MT-GLAZE 1K JA 1/8W |
| R6125 | 401 037 5608 | MT-GLAZE 10K JA 1/10W |
| | | **(MISCELLANEOUS)** |
| X6101 | 4–266V–01100 | CERAMIC RESONATOR 4MHZ |
| X6102 | 4–225V–26900 | CRYSTAL 3200KHZ |

## TM-4 BOARD (DISPLAY & TIMER)
## NO.143-0-233V-49422

| Location | Part No. | Description |
|---|---|---|
| | 143–2–386T–03900 | BRACKET,DIGITAL DISPLAY |
| | | **(COMPOSITE)** |
| B7401 | 4–956V–10304 | R-PACK 10K OHMX4 K |
| B7402 | 4–956V–10304 | R-PACK 10K OHMX4 K |
| | | **(CAPACITORS)** |
| C7401 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C7402 | 403 016 7603 | CERAMIC 2.7PF C 50V |
| C7403 | 403 017 9705 | CERAMIC 22PF J 50V |
| C7404 | 403 017 9705 | CERAMIC 22PF J 50V |
| C7405 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C7406 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7407 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7408 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7409 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7410 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7411 | 403 068 9402 | CERAMIC 100PF K 50V |
| C7412 | 403 121 9509 | CERAMIC 0.1MF Z 50V |
| C7413 | 403 001 1906 | CERAMIC 0.01MF M 16V |
| C7414 | 403 069 1207 | CERAMIC 1000PF K 50V |
| C7415 | 403 048 7107 | ELECT 0.47MF M 50V |
| C7416 | 403 046 4009 | ELECT 33MF M 25V |
| C7417 | 403 046 4009 | ELECT 33MF M 25V |
| C7418 | 403 049 5003 | ELECT 10MF M 50V |
| C7419 | 403 037 8504 | DL-ELECT 0.047F Z 5.5V |
| or | 403 037 8603 | DL-ELECT 0.047F Z 5.5V |

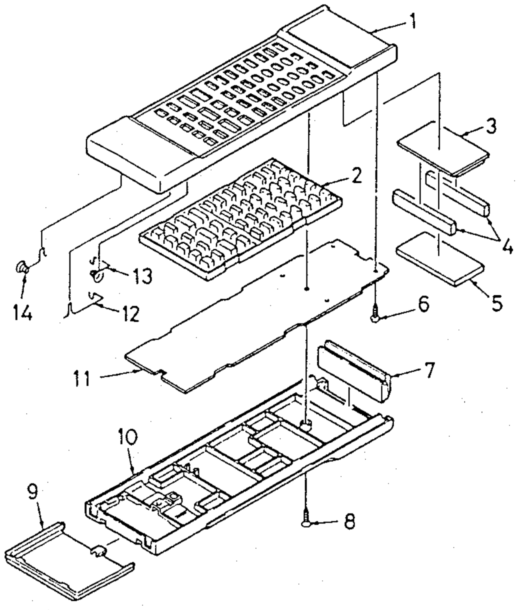
| Location | Part No. | Description |
|---|---|---|
| | | **(DIODES)** |
| D7401 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7402 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7403 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7404 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7405 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7406 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7407 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7408 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7409 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7411 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7412 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7413 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7414 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7415 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7416 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7417 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7418 | 407 005 1603 | DIODE DS135 D |
| D7419 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| D7420 | 407 007 9904 | DIODE GMA01 |
| or | 407 012 4406 | DIODE 1SS133 |
| | | **(INTEGRATED CIRCUITS)** |
| IC7401 | 409 128 3700 | IC M50955-698SP |
| IC7402 | 409 032 3308 | IC MN1280-L |
| | | **(COIL)** |
| L7401 | 4-253V-74314 | HF CHOKE 3.3UH K |
| | | **(RESISTORS)** |
| R7401 | 401 012 9201 | CARBON 1M JA 1/4W |
| R7402 | 401 012 9904 | CARBON 10M JA 1/4W |
| R7403 | 401 018 5702 | CARBON 330K JA 1/4W |
| R7404 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7405 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7406 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7407 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7408 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7409 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7410 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7411 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7412 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7413 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7414 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7415 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7416 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7417 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7418 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7419 | 401 019 2908 | CARBON 39K JA 1/4W |
| R7420 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7421 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7422 | 401 012 6903 | CARBON 10K JA 1/4W |
| R7424 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7425 | 401 018 4804 | CARBON 33K JA 1/4W |
| R7426 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7427 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7428 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7429 | 401 012 5609 | CARBON 1K JA 1/4W |
| R7430 | 401 012 4404 | CARBON 100 JA 1/4W |
| R7431 | 401 017 8506 | CARBON 300 JA 1/4W |
| | | **(MISCELLANEOUS)** |
| A7401 | 4-985V-06000 | DIGITAL DISPLAY |
| A7402 | 4-193V-00200 | REMOTE CONTROL RECEIVER |
| CT7401 | 4-224V-12700 | TRIMMER |
| X7401 | 4-225V-23900 | CRYSTAL 4.19MHZ |
| or | 4-225V-24100 | CRYSTAL 4 19MHZ |
| X7402 | 4-225V-23100 | CRYSTAL 32KHZ |
| or | 4-225V-24200 | CRYSTAL 32KHZ |
| or | 4-225V-26100 | CRYSTAL 32KHZ |

## TM-5 BOARD (SWITCH & VR)
## NO.143-0-233V-49521

| Location | Part No. | Description |
|---|---|---|
| | | **(SWITCHES)** |
| S7001 | 4-231V-72200 | PUSH SWITCH |
| or | 4-231V-73000 | PUSH SWITCH |
| S7002 | 4-231V-72200 | PUSH SWITCH |
| or | 4-231V-73000 | PUSH SWITCH |
| | | **(VARIABLE RESISTORS)** |
| VR7001 | 4-222V-33700 | VR 500K OHM |
| VR7002 | 4-222V-32200 | VR 5K OHM |
| VR7003 | 4-222V-33700 | VR 500K OHM |

## REMOTE CONTROL UNIT
NO. 143-9-4100-68901

| Ref. No. | Part No. | Description |
|---|---|---|
| 1 | 143-0-111T-10701 | CASE, TOP |
| 2 | 143-2-161T-86501 | PUSH BUTTON |
| 3 | 4-970V-00600 | LCD |
| 4 | 4-400V-00400 | CONNECTOR |
| 5 | 143-2-352T-24500 | SPACER |
| 6 | 411 104 7008 | SCR S-TPG BIN 2X5 |
| 7 | 143-2-132T-12100 | IR WINDOW |
| 8 | 411 100 0706 | SCR S-TPG FLT 2X10 |
| 9 | 143-2-128T-03600 | LID, BATTERY |
| 10 | 143-2-125T-09800 | CASE, BOTTOM |
| 11 | 143-0-233V-58300 | RM-1 ASSY. |
| 12 | 143-2-382T-03400 | TERMINAL, INCLUDE RM-1 |
| 13 | 143-2-382T-03300 | TERMINAL, INCLUDE RM-1 |
| 14 | 143-2-382T-03200 | TERMINAL |



## RM-1 BOARD (REMOTE CONTROL)
NO. 143-0-233V-58300

| Location | Part No. | Description |
|---|---|---|
| | | **(CAPACITORS)** |
| C1 | 403 041 9405 | ELECT 10U M 16V |
| C2 | 4-224V-15600 | TRIMMER |
| C3 | 403 017 7404 | CERAMIC 22P J 50V |
| C4 | 403 009 3407 | CERAMIC 100P J 50V |
| C5 | 403 009 3407 | CERAMIC 100P J 50V |
| C6 | 403 042 3006 | ELECT 100U M 16V |
| or | 403 042 3006 | ELECT 100U M 16V |
| C7 | 403 042 3006 | ELECT 100U M 16V |
| C8 | 403 002 1903 | CERAMIC 0.01U K 25V |
| C9 | 403 002 1903 | CERAMIC 0.01U K 25V |
| C10 | 403 002 1903 | CERAMIC 0.01U K 25V |
| | | **(DIODES)** |
| D1 | 407 017 3701 | LED SE303A |
| or | 407 094 6909 | LED LN66S |
| D2 | 407 017 3701 | LED SE303A |
| or | 407 094 6909 | LED LN66S |
| D3 | 407 008 5103 | DIODE MA151K |
| | | **(INTETGRATED CIRCUIT)** |
| IC1 | 409 125 2300 | IC MN158452ESJ |
| | | **(TRANSISTOR)** |
| Q1 | 405 060 3303 | TR UN1231 |
| | | **(RESISTORS)** |
| R1 | 401 012 2202 | CARBON 1.8 JA 1/4W |
| R2 | 401 012 2202 | CARBON 1.8 JA 1/4W |
| R3 | 401 035 8205 | MT-GLAZE 150K JA 1/8W |
| R9 | 401 035 4603 | MT-GLAZE 100 JA 1/8W |
| R10 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| R11 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| R12 | 401 036 8501 | MT-GLAZE 47K JA 1/8W |
| | | **(MISCELLANEOUS)** |
| X1 | 4-266V-01600 | RESONATOR |
| X2 | 4-225V-23100 | RESONATOR |

# BLOCK DIAGRAMS, CIRCUIT DIAGRAMS & PRINTED CIRCUIT BOARDS

# VHR-3500EX

(Europe)

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| — | WAVEFORM OF SERVO | |
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| — | IR REMOTE CONTROL CIRCUIT | |

A11300 BP3/EX 7CH

REFERENCE NO. WM-21823

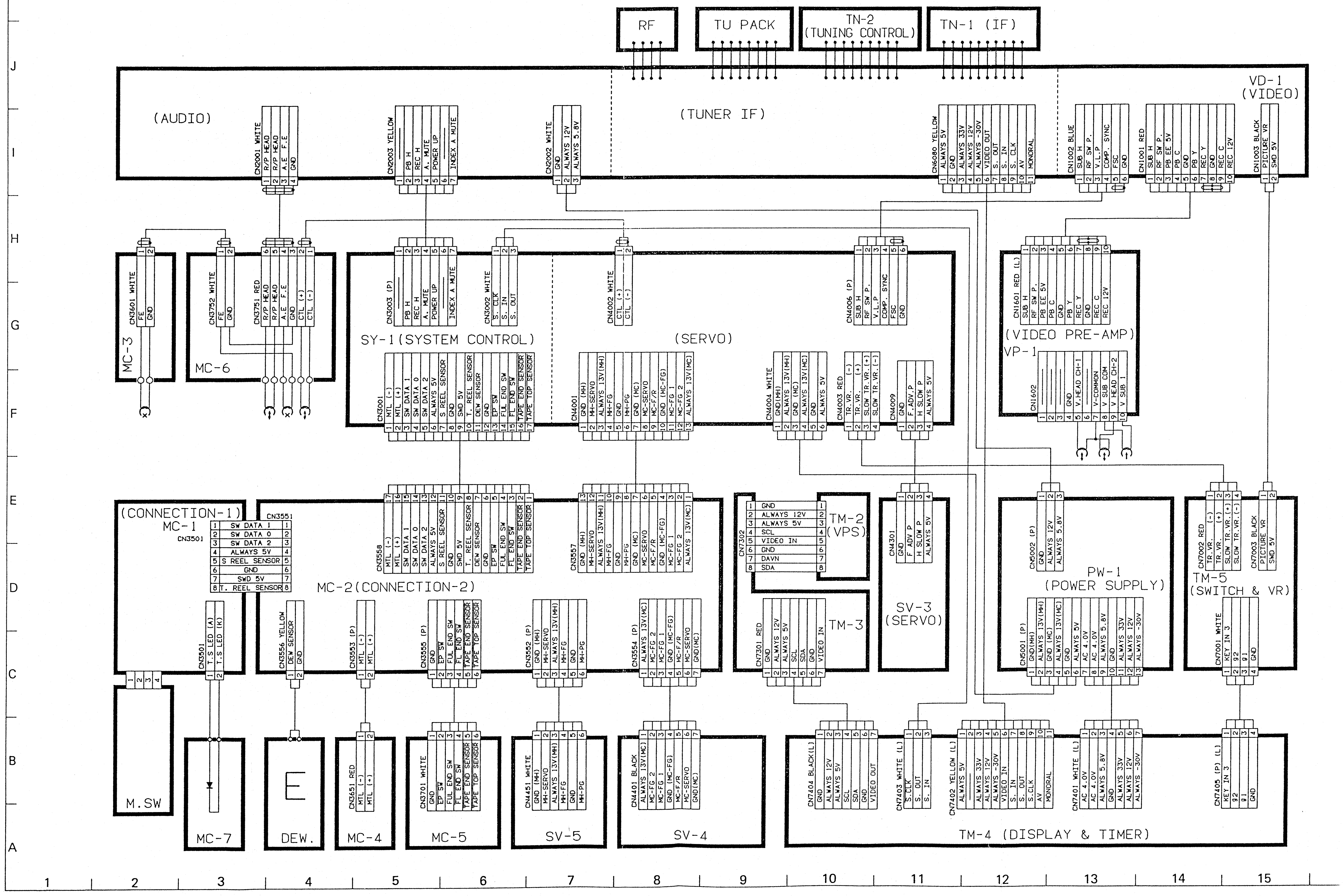
NOTES:

1. All resistance values in "OHMS" unless otherwise noted. (K=1,000 M=1,000,000)
2. All capacitance values in "$\mu$fd" unless otherwise noted.
   p=pico farad
3. All inductance values in "mH" unless otherwise noted. $\mu$=micro henry

PRODUCT SAFETY NOTICE

THE COMPONENTS DESIGNATED BY A SYMBOL (⚠) IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SIMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

# OVERALL WIRING DIAGRAM


RF
TU PACK
TN-2 (TUNING CONTROL)
TN-1 (IF)
VD-1 (VIDEO)
(AUDIO)
(TUNER IF)
CN2001 WHITE 1 R/P HEAD 2 R/P HEAD 3 A.E F.E 4 GND
CN2003 YELLOW 1 —— 2 PB H 3 REC H 4 A. MUTE 5 POWER UP 6 —— 7 INDEX A MUTE
CN2002 WHITE 1 GND 2 ALWAYS 12V 3 ALWAYS 5.8V
CN6080 YELLOW 1 ALWAYS 5V 2 GND 3 ALWAYS 33V 4 ALWAYS 12V 5 ALWAYS -30V 6 VIDEO OUT 7 S. OUT 8 S. IN 9 S. CLK 10 AV 11 MONORAL
CN1002 BLUE 1 SUB H 2 RF SW P. 3 V.L.P 4 COMP. SYNC 5 FSC 6 GND
CN1001 RED 1 SUB H 2 RF SW P. 3 PB EE 5V 4 PB C 5 GND 6 PB Y 7 REC Y 8 GND 9 REC C 10 REC 12V
CN1003 BLACK 1 PICTURE VR 2 SWD 5V
MC-3
CN3601 WHITE 1 FE 2 GND
MC-6
CN3752 WHITE 1 FE 2 GND
CN3751 RED 6 R/P HEAD 5 R/P HEAD 4 A.E F.E 3 GND 2 CTL (+) 1 CTL (-)
SY-1 (SYSTEM CONTROL)
(SERVO)
CN3003 (P) 1 —— 2 PB H 3 REC H 4 A. MUTE 5 POWER UP 6 —— 7 INDEX A MUTE
CN3002 WHITE 1 S. CLK 2 S. IN 3 S. OUT
CN4002 WHITE 1 CTL (+) 2 CTL (-)
CN4006 (P) 1 SUB H 2 RF SW P. 3 V.L.P 4 COMP. SYNC 5 FSC 6 GND
CN3001 1 MTL (-) 2 MTL (+) 3 SW DATA 1 4 SW DATA 0 5 SW DATA 2 6 ALWAYS 5V 7 S REEL SENSOR 8 GND 9 SWD 5V 10 T. REEL SENSOR 11 DEW SENSOR 12 GND 13 EP SW 14 FUL END SW 15 FL END SW 16 TAPE END SENSOR 17 TAPE TOP SENSOR
CN4001 1 GND (MH) 2 MH-SERVO 3 ALWAYS 13V(MH) 4 MH-FG 5 GND 6 MH-PG 7 GND (MC) 8 MC-SERVO 9 MC-F/R 10 GND (MC-FG) 11 MC-FG 1 12 MC-FG 2 13 ALWAYS 13V(MC)
CN4004 WHITE 1 GND(MH) 2 ALWAYS 13V(MH) 3 GND (MC) 4 ALWAYS 13V(MC) 5 GND 6 ALWAYS 5V
CN4003 RED 1 (-) 2 TR.VR. (+) 3 SLOW TR.VR.(+) 4 SLOW TR.VR.(-)
CN4009 1 GND 2 F.ADV.P 3 H SLOW P 4 ALWAYS 5V
(VIDEO PRE-AMP)
VP-1
CN1601 RED (L) 1 SUB H 2 RF SW P. 3 PB EE 5V 4 PB C 5 GND 6 PB Y 7 REC Y 8 GND 9 REC C 10 REC 12V
CN1602 1 | 2 | 3 | 4 GND 5 V.HEAD CH-1 6 V-COMMON 7 V SUB COM 8 V HEAD CH-2 9 V SUB 1
(CONNECTION-1)
MC-1
CN3501
CN3551
1 SW DATA 1 1
2 SW DATA 0 2
3 SW DATA 2 3
4 ALWAYS 5V 4
5 S REEL SENSOR 5
6 GND 6
7 SWD 5V 7
8 T. REEL SENSOR 8
MC-2 (CONNECTION-2)
CN3558 17 MTL (-) 16 MTL (+) 15 SW DATA 1 14 SW DATA 0 13 SW DATA 2 12 ALWAYS 5V 11 S REEL SENSOR 10 GND 9 SWD 5V 8 T. REEL SENSOR 7 DEW SENSOR 6 GND 5 EP SW 4 FUL END SW 3 FL END SW 2 TAPE END SENSOR 1 TAPE TOP SENSOR
CN3557 13 GND (MH) 12 MH-SERVO 11 ALWAYS 13V(MH) 10 MH-FG 9 GND 8 MH-PG 7 GND (MC) 6 MC-SERVO 5 MC-F/R 4 GND (MC-FG) 3 MC-FG 1 2 MC-FG 2 1 ALWAYS 13V(MC)
CN3501 1 T.S LED (A) 2 T.S LED (K)
CN3556 YELLOW 1 DEW SENSOR 2 GND
CN3553 (P) 1 MTL (-) 2 MTL (+)
CN3555 (P) 1 GND 2 EP SW 3 FUL END SW 4 FL END SW 5 TAPE END SENSOR 6 TAPE TOP SENSOR
CN3552 (P) 1 GND (MH) 2 MH-SERVO 3 ALWAYS 13V(MH) 4 MH-FG 5 GND 6 MH-PG
CN3554 (P) 1 ALWAYS 13V(MC) 2 MC-FG 2 3 MC-FG 1 4 GND (MC-FG) 5 MC-F/R 6 MC-SERVO 7 GND(MC)
CN7302 1 GND 2 ALWAYS 12V 3 ALWAYS 5V 4 SCL 5 VIDEO IN 6 GND 7 DAVN 8 SDA
TM-2 (VPS)
TM-3
CN7301 RED 1 GND 2 ALWAYS 12V 3 ALWAYS 5V 4 SCL 5 SDA 6 GND 7 VIDEO IN
CN4301 1 GND 2 F. ADV P 3 H SLOW P 4 ALWAYS 5V
SV-3 (SERVO)
CN5002 (P) 1 GND 2 ALWAYS 12V 3 ALWAYS 5.8V
PW-1 (POWER SUPPLY)
CN5001 (P) 1 GND(MH) 2 ALWAYS 13V(MH) 3 GND (MC) 4 ALWAYS 13V(MC) 5 GND 6 ALWAYS 5V 7 AC 4.0V 8 AC 4.0V 9 ALWAYS 5.8V 10 GND 11 ALWAYS 33V 12 ALWAYS 12V 13 ALWAYS -30V
CN7002 RED 1 (-) 2 TR.VR. (+) 3 SLOW TR.VR.(+) 4 SLOW TR.VR.(-)
CN7003 BLACK 1 PICTURE VR 2 SWD 5V
TM-5 (SWITCH & VR)
CN7001 WHITE 1 KEY IN 3 2 92 3 91 4 GND
M.SW
MC-7
DEW.
E
CN3651 RED 1 MTL (-) 2 MTL (+)
MC-4
CN3701 WHITE 1 GND 2 EP SW 3 FUL END SW 4 FL END SW 5 TAPE END SENSOR 6 TAPE TOP SENSOR
MC-5
CN4451 WHITE 1 GND (MH) 2 MH-SERVO 3 ALWAYS 13V(MH) 4 MH-FG 5 GND 6 MH-PG
SV-5
CN4401 BLACK 1 ALWAYS 13V(MC) 2 MC-FG 2 3 MC-FG 1 4 GND (MC-FG) 5 MC-F/R 6 MC-SERVO 7 GND(MC)
SV-4
CN7404 BLACK(L) 1 GND 2 ALWAYS 12V 3 ALWAYS 5V 4 SCL 5 SDA 6 GND 7 VIDEO OUT
CN7403 WHITE (L) 1 S.CLK 2 S. OUT 3 S. IN
CN7402 YELLOW (L) 1 ALWAYS 5V 2 —— 3 ALWAYS 33V 4 ALWAYS 12V 5 ALWAYS -30V 6 VIDEO IN 7 S. IN 8 S. OUT 9 S.CLK 10 AV 11 MONORAL
CN7401 WHITE (L) 1 AC 4.0V 2 AC 4.0V 3 ALWAYS 5.8V 4 GND 5 ALWAYS 33V 6 ALWAYS 12V 7 ALWAYS -30V
CN7405 (P) (L) 1 KEY IN 3 2 92 3 91 4 GND
TM-4 (DISPLAY & TIMER)
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
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9
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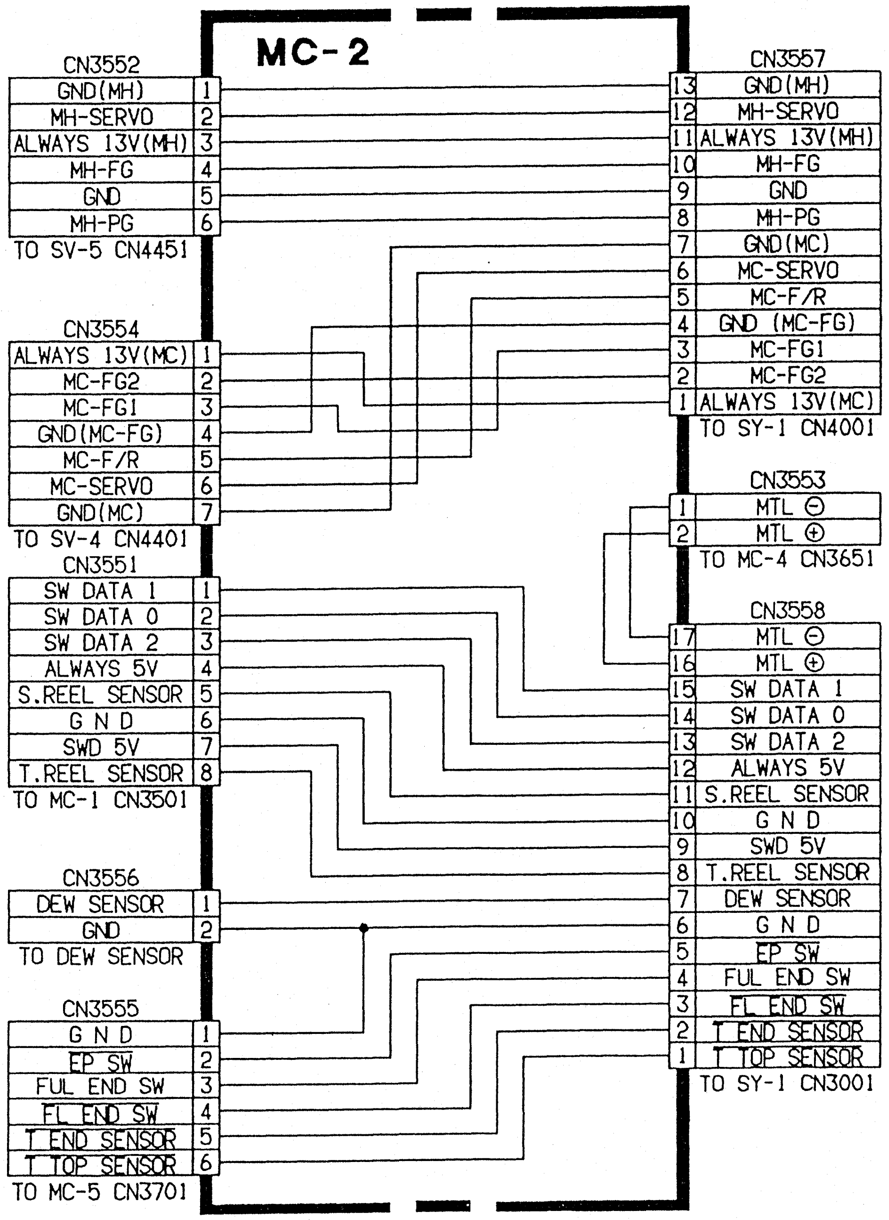
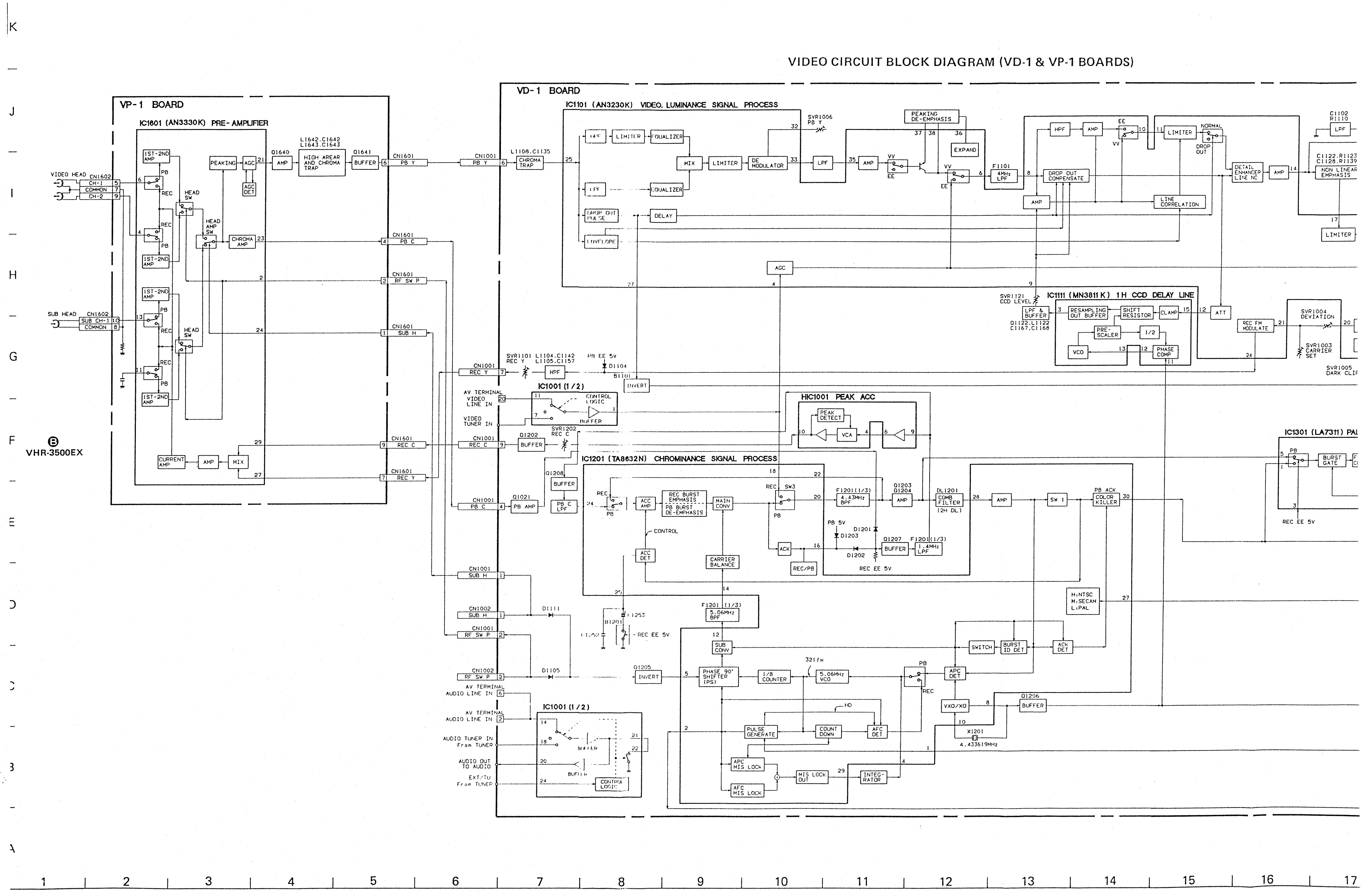
15

## P.C.B. MC-2 CONNECTION CIRCUIT (143-0-233V-26750)


MC-2
CN3552
1 GND(MH)
2 MH-SERVO
3 ALWAYS 13V(MH)
4 MH-FG
5 GND
6 MH-PG
TO SV-5 CN4451
CN3554
1 ALWAYS 13V(MC)
2 MC-FG2
3 MC-FG1
4 GND(MC-FG)
5 MC-F/R
6 MC-SERVO
7 GND(MC)
TO SV-4 CN4401
CN3551
1 SW DATA 1
2 SW DATA 0
3 SW DATA 2
4 ALWAYS 5V
5 S.REEL SENSOR
6 GND
7 SWD 5V
8 T.REEL SENSOR
TO MC-1 CN3501
CN3556
1 DEW SENSOR
2 GND
TO DEW SENSOR
CN3555
1 GND
2 EP SW
3 FUL END SW
4 FL END SW
5 T END SENSOR
6 T TOP SENSOR
TO MC-5 CN3701
CN3557
13 GND(MH)
12 MH-SERVO
11 ALWAYS 13V(MH)
10 MH-FG
9 GND
8 MH-PG
7 GND(MC)
6 MC-SERVO
5 MC-F/R
4 GND (MC-FG)
3 MC-FG1
2 MC-FG2
1 ALWAYS 13V(MC)
TO SY-1 CN4001
CN3553
1 MTL ⊖
2 MTL ⊕
TO MC-4 CN3651
CN3558
17 MTL ⊖
16 MTL ⊕
15 SW DATA 1
14 SW DATA 0
13 SW DATA 2
12 ALWAYS 5V
11 S.REEL SENSOR
10 GND
9 SWD 5V
8 T.REEL SENSOR
7 DEW SENSOR
6 GND
5 EP SW
4 FUL END SW
3 FL END SW
2 T END SENSOR
1 T TOP SENSOR
TO SY-1 CN3001

# VIDEO CIRCUIT BLOCK DIAGRAM (VD-1 & VP-1 BOARDS)


VP-1 BOARD
IC1601 (AN3330K) PRE-AMPLIFIER
VIDEO HEAD
CN1602
CH-1
COMMON
CH-2
SUB HEAD
SUB CH-1
1ST-2ND AMP
PB
REC
HEAD SW
HEAD AMP SW
PEAKING
AGC
AGC DET
CHROMA AMP
CURRENT AMP
AMP
MIX
Q1640
AMP
L1642.C1642
L1643.C1643
HIGH AREAR AND CHROMA TRAP
Q1641
BUFFER
CN1601
PB Y
PB C
RF SW P
SUB H
REC C
REC Y
VHR-3500EX
VD-1 BOARD
IC1101 (AN3230K) VIDEO, LUMINANCE SIGNAL PROCESS
CN1001
L1108.C1135
CHROMA TRAP
HPF
LIMITER
EQUALIZER
LPF
MIX
DE MODULATOR
DROP OUT PULSE
DELAY
ENVELOPE
SVR1006 PB Y
PEAKING DE-EMPHASIS
EXPAND
VV
EE
F1101 4MHz LPF
DROP OUT COMPENSATE
LINE CORRELATION
NORMAL
DROP OUT
DETAIL ENHANCER LINE NC
C1102 R1110
C1122.R1123
C1128.R1139
NON LINEAR EMPHASIS
ATT
REC FM MODULATE
SVR1004 DEVIATION
SVR1003 CARRIER SET
SVR1005 DARK CLIP
AGC
SVR1121 CCD LEVEL
IC1111 (MN3811K) 1H CCD DELAY LINE
LPF & BUFFER
Q1122.L1122
C1167.C1168
RESAMPLING OUT BUFFER
SHIFT RESISTOR
CLAMP
PRE-SCALER
1/2
VCO
PHASE COMP
SVR1101 REC Y
L1104.C1142
L1105.C1157
PB EE 5V
D1104
B1101
INVERT
IC1001 (1/2)
AV TERMINAL VIDEO LINE IN
VIDEO TUNER IN
CONTROL LOGIC
BUFFER
HIC1001 PEAK ACC
PEAK DETECT
VCA
Q1202
SVR1202 REC C
Q1208
PB C LPF
Q1021
PB AMP
IC1201 (TA8632N) CHROMINANCE SIGNAL PROCESS
ACC AMP
REC BURST EMPHASIS
PB BURST DE-EMPHASIS
MAIN CONV
CONTROL
ACC DET
CARRIER BALANCE
SW3
F1201 (1/3) 4.43MHz BPF
Q1203 Q1204
PB 5V
D1203
D1201
D1202
ACK
REC/PB
Q1207
F1201 (1/3) 1.4MHz LPF
REC EE 5V
DL1201 COMB FILTER (2H DL)
SW 1
PB ACK COLOR KILLER
IC1301 (LA7311) PAL
BURST GATE
H:NTSC M:SECAM L:PAL
F1201 (1/3) 5.06MHz BPF
SUB CONV
SWITCH
BURST ID DET
ACK DET
APC DET
VXO/XO
Q1206
X1201
4.433619MHz
CN1002
D1111
D1105
B1201
C1253
C1252
Q1205
PHASE 90° SHIFTER (PS)
1/8 COUNTER
321fH
5.06MHz VCO
HD
PULSE GENERATE
COUNT DOWN
AFC DET
APC MIS LOCK
AFC MIS LOCK
MIS LOCK OUT
INTEGRATOR
AV TERMINAL AUDIO LINE IN
AUDIO TUNER IN From TUNER
AUDIO OUT TO AUDIO
EXT/TU From TUNER
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
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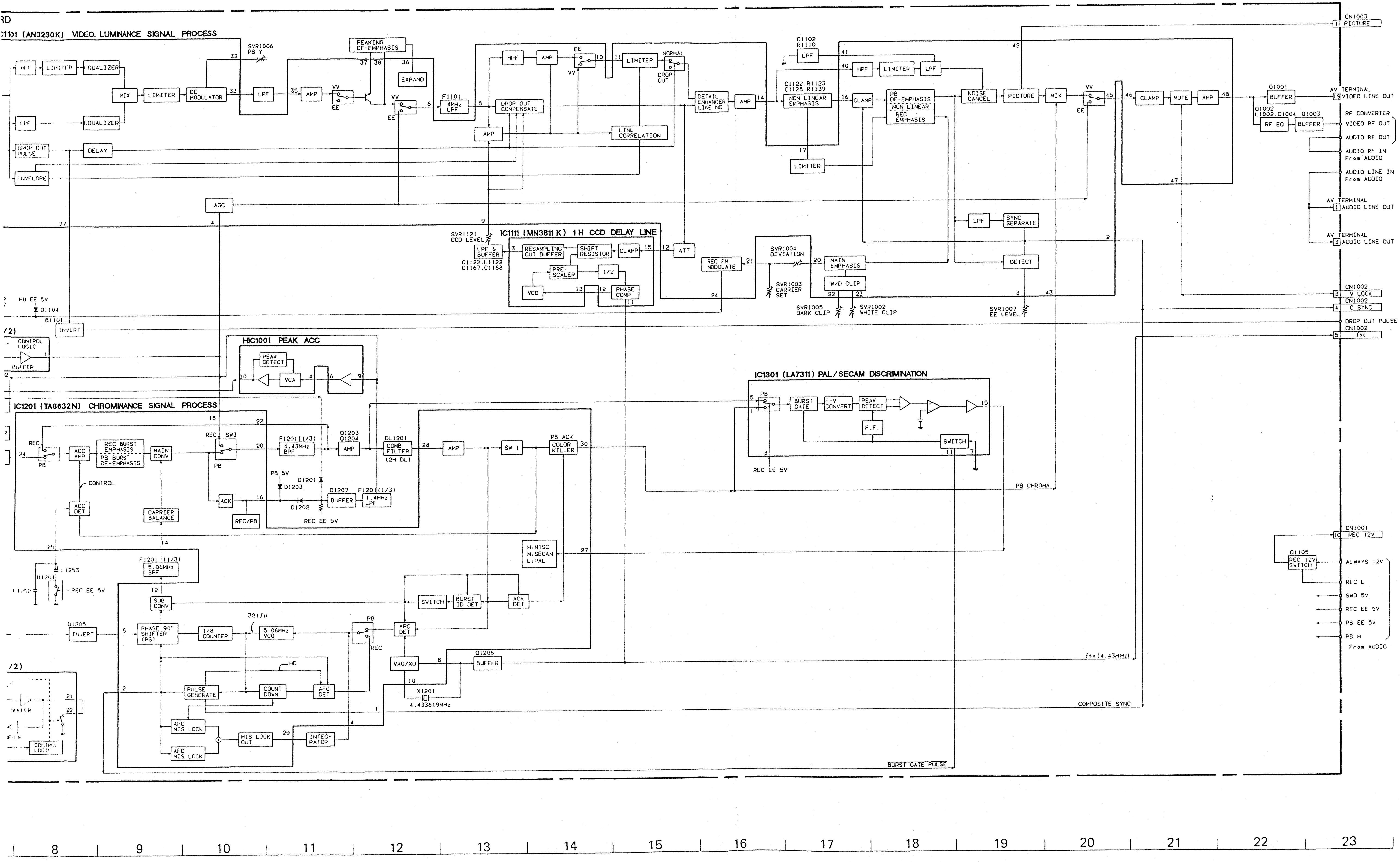
17

# VIDEO CIRCUIT BLOCK DIAGRAM (VD-1 & VP-1 BOARDS)


RD
C1101 (AN3230K) VIDEO. LUMINANCE SIGNAL PROCESS
HPF
LIMITER
EQUALIZER
LPF
EQUALIZER
MIX
LIMITER
DE MODULATOR
DROP OUT PULSE
DELAY
ENVELOPE
SVR1006 PB Y
LPF
AMP
VV
EE
PEAKING DE-EMPHASIS
EXPAND
F1101 4MHz LPF
DROP OUT COMPENSATE
HPF
AMP
AMP
EE
VV
LIMITER
NORMAL
DROP OUT
LINE CORRELATION
AGC
DETAIL ENHANCER LINE NC
AMP
C1102 R1110
LPF
HPF
LIMITER
LPF
C1122.R1123 C1128.R1139
NON LINEAR EMPHASIS
LIMITER
CLAMP
PB DE-EMPHASIS
NON LINEAR
REC EMPHASIS
NOISE CANCEL
PICTURE
MIX
CLAMP
MUTE
AMP
Q1001 BUFFER
Q1002 L1002.C1004
RF EQ
Q1003 BUFFER
CN1003 1 PICTURE
AV TERMINAL 19 VIDEO LINE OUT
RF CONVERTER
VIDEO RF OUT
AUDIO RF OUT
AUDIO RF IN From AUDIO
AUDIO LINE IN From AUDIO
AV TERMINAL 1 AUDIO LINE OUT
AV TERMINAL 3 AUDIO LINE OUT
LPF
SYNC SEPARATE
DETECT
SVR1007 EE LEVEL
SVR1121 CCD LEVEL
IC1111 (MN3811K) 1H CCD DELAY LINE
LPF & BUFFER
Q1122.L1122 C1167.C1168
RESAMPLING OUT BUFFER
SHIFT RESISTOR
CLAMP
PRE-SCALER
1/2
VCO
PHASE COMP
ATT
REC FM MODULATE
SVR1004 DEVIATION
SVR1003 CARRIER SET
MAIN EMPHASIS
W/D CLIP
SVR1005 DARK CLIP
SVR1002 WHITE CLIP
CN1002 3 V LOCK
CN1002 4 C SYNC
DROP OUT PULSE
CN1002 5 fsc
PB EE 5V
D1104
B1101
INVERT
/2)
CONTROL LOGIC
BUFFER
HIC1001 PEAK ACC
PEAK DETECT
VCA
IC1201 (TA8632N) CHROMINANCE SIGNAL PROCESS
REC
PB
ACC AMP
REC BURST EMPHASIS
PB BURST DE-EMPHASIS
MAIN CONV
CONTROL
ACC DET
CARRIER BALANCE
REC SW3
PB
ACK
REC/PB
F1201(1/3) 4.43MHz BPF
PB 5V
D1201
D1203
D1202
Q1203 Q1204 AMP
Q1207 BUFFER
F1201(1/3) 1.4MHz LPF
REC EE 5V
DL1201 COMB FILTER (2H DL)
AMP
SW 1
PB ACK COLOR KILLER
H:NTSC M:SECAM L:PAL
C1253
B1201
C1252
REC EE 5V
F1201 (1/3) 5.06MHz BPF
SUB CONV
Q1205 INVERT
PHASE 90° SHIFTER (PS)
1/8 COUNTER
321fH
5.06MHz VCO
PB
REC
APC DET
SWITCH
BURST ID DET
ACK DET
VXO/XO
Q1206 BUFFER
X1201 4.433619MHz
HD
PULSE GENERATE
COUNT DOWN
AFC DET
APC MIS LOCK
AFC MIS LOCK
MIS LOCK OUT
INTEG-RATOR
IC1301 (LA7311) PAL/SECAM DISCRIMINATION
PB
BURST GATE
F-V CONVERT
PEAK DETECT
F.F.
SWITCH
REC EE 5V
PB CHROMA
fsc (4.43MHz)
COMPOSITE SYNC
BURST GATE PULSE
CN1001 10 REC 12V
Q1105 REC 12V SWITCH
ALWAYS 12V
REC L
SWD 5V
REC EE 5V
PB EE 5V
PB H
From AUDIO
8
9
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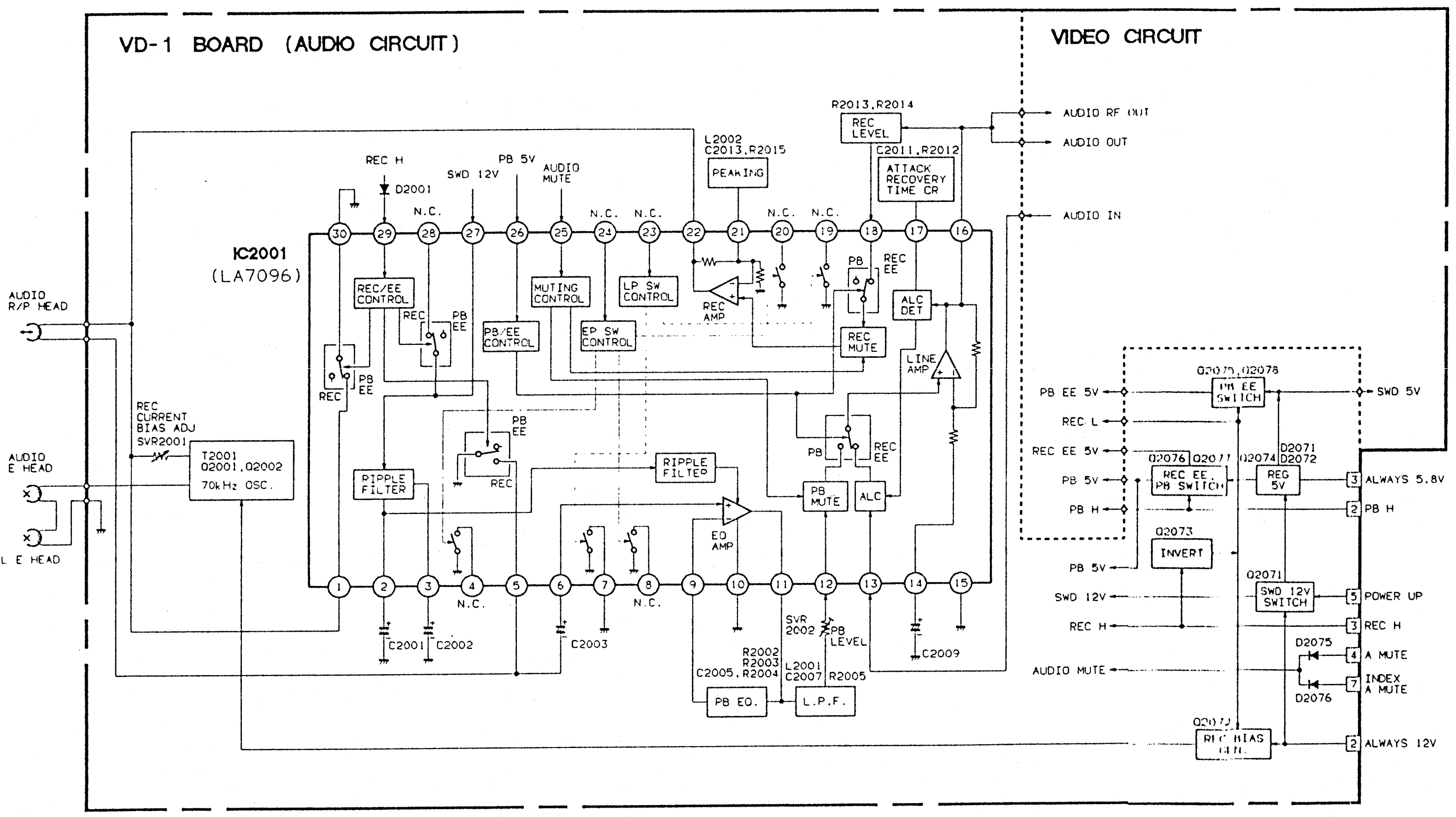
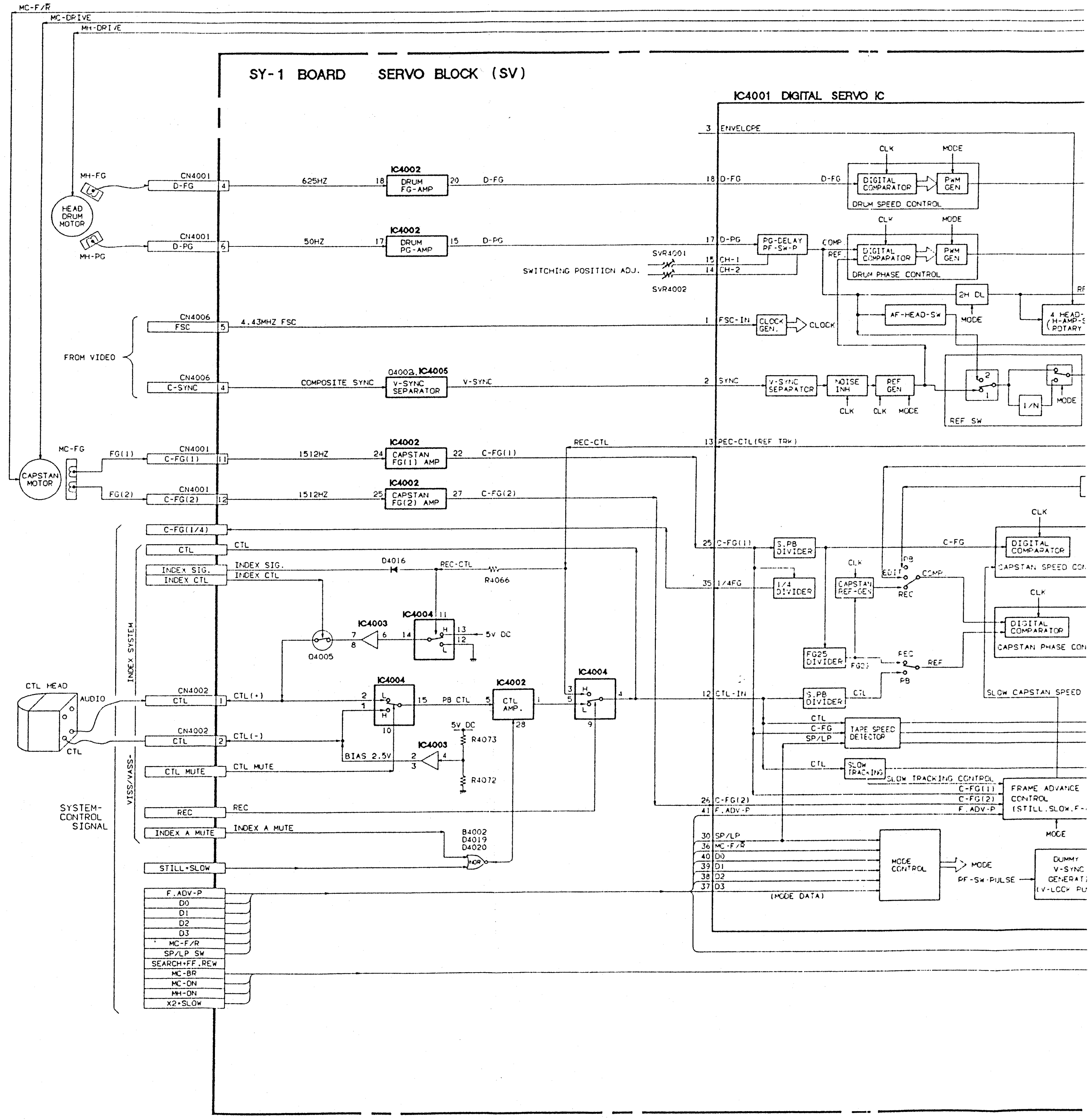
23

## AUDIO CIRCUIT BLOCK DIAGRAM (VD-1 BOARD)

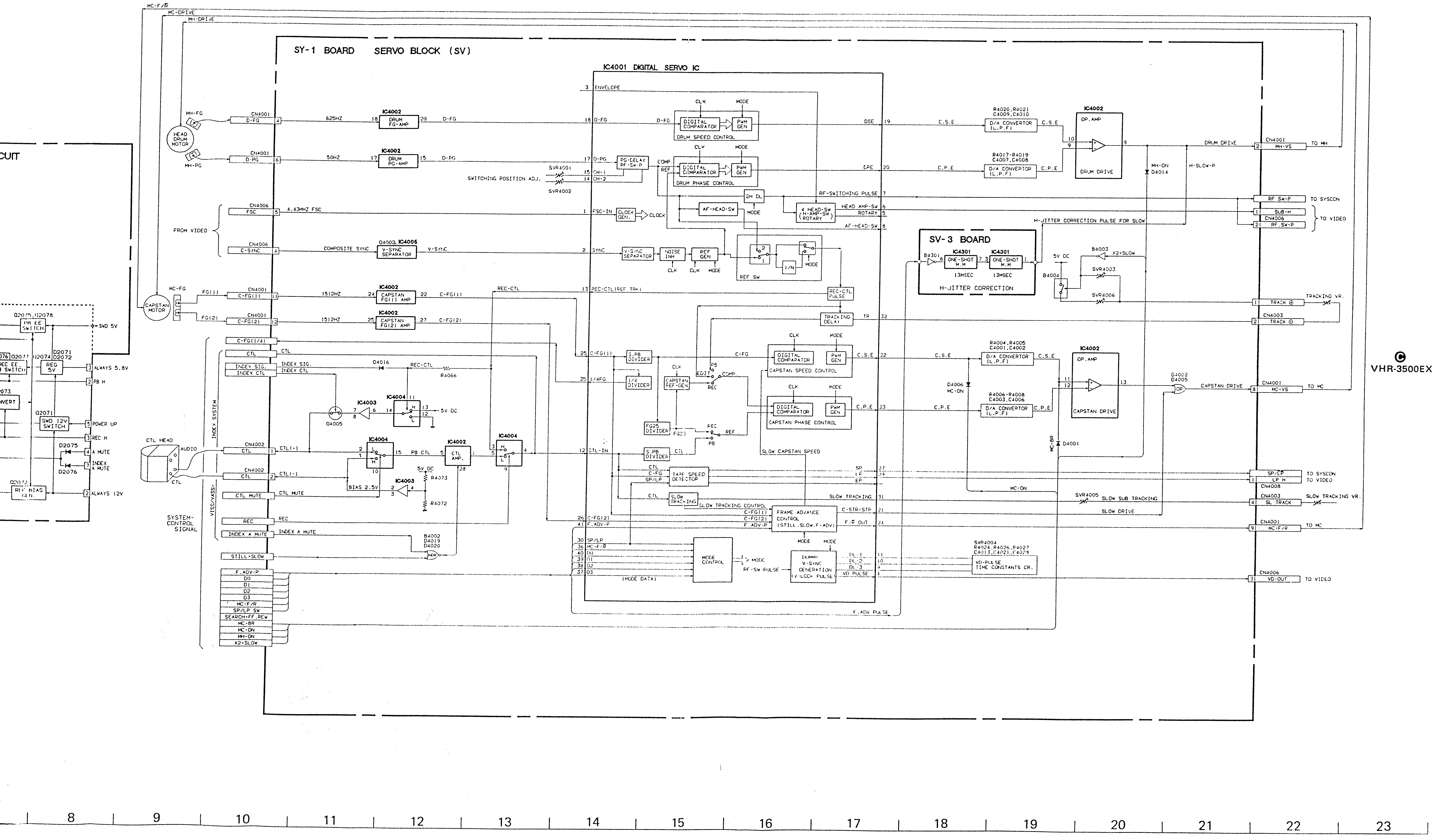

VD-1 BOARD (AUDIO CIRCUIT)
VIDEO CIRCUIT
IC2001
(LA7096)
AUDIO R/P HEAD
AUDIO E HEAD
FULL E HEAD
REC CURRENT BIAS ADJ SVR2001
T2001 Q2001,Q2002 70kHz OSC.
REC H
D2001
SWD 12V
PB 5V
AUDIO MUTE
N.C.
REC/EE CONTROL
MUTING CONTROL
LP SW CONTROL
PB/EE CONTROL
EP SW CONTROL
REC AMP
REC MUTE
ALC DET
LINE AMP
PEAKING
L2002 C2013,R2015
R2013,R2014
REC LEVEL
C2011,R2012
ATTACK RECOVERY TIME CR
RIPPLE FILTER
PB MUTE
ALC
EQ AMP
PB EQ.
L.P.F.
C2001
C2002
C2003
C2009
SVR 2002 PB LEVEL
R2002 R2003 C2005,R2004
L2001 C2007
R2005
AUDIO RF OUT
AUDIO OUT
AUDIO IN
PB EE 5V
REC L
REC EE 5V
PB 5V
PB H
SWD 12V
REC H
AUDIO MUTE
Q2075,Q2078 PB EE SWITCH
Q2076,Q2077 REC EE PB SWITCH
Q2074,D2071 D2072 REG 5V
Q2073 INVERT
Q2071 SWD 12V SWITCH
D2075
D2076
Q2072 REC BIAS GEN.
SWD 5V
ALWAYS 5.8V
PB H
POWER UP
REC H
A MUTE
INDEX A MUTE
ALWAYS 12V

## SERVO CIRCUIT BLOCK DIAGRAM (SY-1


MC-F/R
MC-DRIVE
MH-DRIVE
SY-1 BOARD SERVO BLOCK (SV)
IC4001 DIGITAL SERVO IC
HEAD DRUM MOTOR
MH-FG
MH-PG
CN4001 D-FG
CN4001 D-PG
625HZ
50HZ
IC4002 DRUM FG-AMP
IC4002 DRUM PG-AMP
D-FG
D-PG
ENVELOPE
DIGITAL COMPARATOR
PWM GEN
DRUM SPEED CONTROL
DRUM PHASE CONTROL
CLK
MODE
PG-DELAY PF-SW-P
SVR4001
SVR4002
SWITCHING POSITION ADJ.
CH-1
CH-2
2H DL
AF-HEAD-SW
4 HEAD-H-AMP-S (ROTARY
FROM VIDEO
CN4006 FSC
4.43MHZ FSC
FSC-IN
CLOCK GEN.
CLOCK
CN4006 C-SYNC
COMPOSITE SYNC
Q4003, IC4005 V-SYNC SEPARATOR
V-SYNC
SYNC
V-SYNC SEPARATOR
NOISE INH
REF GEN
REF SW
1/N
CAPSTAN MOTOR
MC-FG
FG(1)
FG(2)
CN4001 C-FG(1)
CN4001 C-FG(2)
1512HZ
IC4002 CAPSTAN FG(1) AMP
IC4002 CAPSTAN FG(2) AMP
C-FG(1)
C-FG(2)
REC-CTL
REC-CTL(REF TRK)
C-FG(1/4)
CTL
INDEX SIG.
INDEX CTL
D4016
R4066
IC4003
Q4005
IC4004
5V DC
CTL HEAD
AUDIO
CTL
CN4002 CTL
CTL(+)
CTL(-)
PB CTL
IC4002 CTL AMP.
BIAS 2.5V
R4073
R4072
CTL MUTE
REC
INDEX A MUTE
B4002 D4019 D4020
STILL-SLOW
SYSTEM-CONTROL SIGNAL
INDEX SYSTEM
VSS/VASS
F.ADV-P
D0
D1
D2
D3
MC-F/R
SP/LP SW
SEARCH-FF.REW
MC-BR
MC-ON
MH-ON
X2-SLOW
S.PB DIVIDER
1/4 DIVIDER
1/4FG
CAPSTAN REF-GEN
EDIT
COMP
DIGITAL COMPARATOR
CAPSTAN SPEED CON
CAPSTAN PHASE CON
FG25 DIVIDER
REF
PB
CTL-IN
TAPE SPEED DETECTOR
SP/LP
SLOW TRACKING
SLOW TRACKING CONTROL
SLOW CAPSTAN SPEED
FRAME ADVANCE CONTROL (STILL,SLOW,F-
F.ADV-P
MODE CONTROL
MODE
PF-SW-PULSE
DUMMY V-SYNC GENERAT (V-LOCK PU
(MODE DATA)

K J I H G F E D C B A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

# SERVO CIRCUIT BLOCK DIAGRAM (SY-1 & SV-3 BOARDS)



MC-F/R
MC-DRIVE
MH-DRIVE
SY-1 BOARD SERVO BLOCK (SV)
IC4001 DIGITAL SERVO IC
3 ENVELOPE
CLK
MODE
MH-FG
HEAD DRUM MOTOR
MH-PG
CN4001 D-FG 4
625HZ
IC4002 DRUM FG-AMP
18 20 D-FG
18 D-FG
DIGITAL COMPARATOR
PWM GEN
DRUM SPEED CONTROL
DSE 19
C.S.E
R4020,R4021 C4009,C4010
D/A CONVERTOR (L.P.F)
IC4002 OP.AMP
DRUM DRIVE
CN4001 D-PG 6
50HZ
IC4002 DRUM PG-AMP
17 15 D-PG
17 D-PG
PG-DELAY PF-SW-P
SVR4001
SWITCHING POSITION ADJ.
15 CH-1
14 CH-2
SVR4002
COMP REF
DRUM PHASE CONTROL
DPE 20
C.P.E
R4017-R4019 C4007,C4008
MH-ON D4014
H-SLOW-P
DRUM DRIVE
CN4001 MH-VS 2
TO MH
2H DL
RF-SWITCHING PULSE 7
AF-HEAD-SW
MODE
4 HEAD-SW (H-AMP-SW ROTARY)
HEAD AMP-SW 6
ROTARY 5
AF-HEAD-SW 8
RF SW-P
TO SYSCON
SUB-H
CN4006
RF.SW-P
TO VIDEO
CN4006 FSC 5
4.43MHZ FSC
1 FSC-IN
CLOCK GEN.
CLOCK
FROM VIDEO
H-JITTER CORRECTION PULSE FOR SLOW
CN4006 C-SYNC 4
COMPOSITE SYNC
Q4003, IC4005 V-SYNC SEPARATOR
V-SYNC
2 SYNC
V-SYNC SEPARATOR
NOISE INH
REF GEN
CLK
REF SW
1/N
SV-3 BOARD
B4301
IC4301 ONE-SHOT M.M
13MSEC
H-JITTER CORRECTION
5V DC
B4003
X2-SLOW
B4004
SVR4003
SVR4006
TRACKING VR.
TRACK ⊕
CN4003
TRACK ⊖
MC-FG
FG(1)
CAPSTAN MOTOR
CN4001 C-FG(1) 11
1512HZ
IC4002 CAPSTAN FG(1) AMP
24 22 C-FG(1)
REC-CTL
13 REC-CTL(REF TR)
REC-CTL PULSE
FG(2)
CN4001 C-FG(2) 12
IC4002 CAPSTAN FG(2) AMP
25 27 C-FG(2)
TRACKING DELAY
TP 32
C-FG(1/4)
CTL
INDEX SIG.
INDEX CTL
25 C-FG(1)
3 PB DIVIDER
C-FG
EDIT PB
COMP
REC
DIGITAL COMPARATOR
CAPSTAN SPEED CONTROL
C.S.E 22
R4004,R4005 C4001,C4002
IC4002 OP.AMP
35 1/4FG
1/4 DIVIDER
CAPSTAN REF-GEN
D4016
REC-CTL
R4066
IC4003
IC4004
5V DC
Q4005
D4006 MC-ON
C.P.E 23
R4006-R4008 C4003,C4006
CAPSTAN PHASE CONTROL
CAPSTAN DRIVE
D4002 D4005
OR
CAPSTAN DRIVE
CN4001 MC-VS 8
TO MC
VHR-3500EX
FG25 DIVIDER
FG25
REF
PB
INDEX SYSTEM
CTL HEAD
AUDIO
CN4002 CTL 1
CTL(+)
CTL
CN4002 CTL 2
CTL(-)
IC4004
L H
PB CTL
IC4002 CTL AMP.
28
12 CTL-IN
3 PB DIVIDER
MC-BR
D4001
SLOW CAPSTAN SPEED
SP 27
LP 29
EP
TAPE SPEED DETECTOR
SP/LP
TO SYSCON
LP H
TO VIDEO
CN4008
BIAS 2.5V
IC4003
R4073
R4072
MC-ON
SVR4005
SLOW SUB TRACKING
CN4003
SL TRACK
SLOW TRACKING VR.
SLOW TRACKING 31
SLOW TRACKING
SLOW TRACKING CONTROL
CTL MUTE
SYSTEM-CONTROL SIGNAL
VISS/VASS
REC
C-STR/STP 21
SLOW DRIVE
26 C-FG(2)
41 F.ADV-P
FRAME ADVANCE CONTROL (STILL,SLOW,F-ADV)
F/F OUT 24
CN4001 MC-F/R 9
TO MC
INDEX A MUTE
B4002 D4019 D4020
30 SP/LP
36 MC-F/R
40 D0
39 D1
38 D2
37 D3
MODE CONTROL
MODE
PF-SW-PULSE
DUMMY V-SYNC GENERATION (V-LOCK PULSE)
DL 1 11
DL 2 10
DL 3 9
VD PULSE 1
SVR4004 R4024,R4026,R4027 C4013,C4021,C4023
VD-PULSE TIME CONSTANTS CR.
CN4006 VD-OUT 3
TO VIDEO
STILL-SLOW
F.ADV-P
D0
D1
D2
D3
MC-F/R
SP/LP SW
SEARCH-FF.REW
MC-BR
MC-ON
MH-ON
X2-SLOW
(MODE DATA)
F.ADV PULSE
CUIT
Q2077,Q2078
PB EE SWITCH
SWD 5V
Q2071 Q2074
REC EE SWITCH
D2071 D2072
REG 5V
ALWAYS 5.8V
PB H
Q2073
INVERT
Q2071
SWD 12V SWITCH
POWER UP
REC H
D2075
A MUTE
INDEX A MUTE
D2076
REC BIAS GEN.
ALWAYS 12V
8
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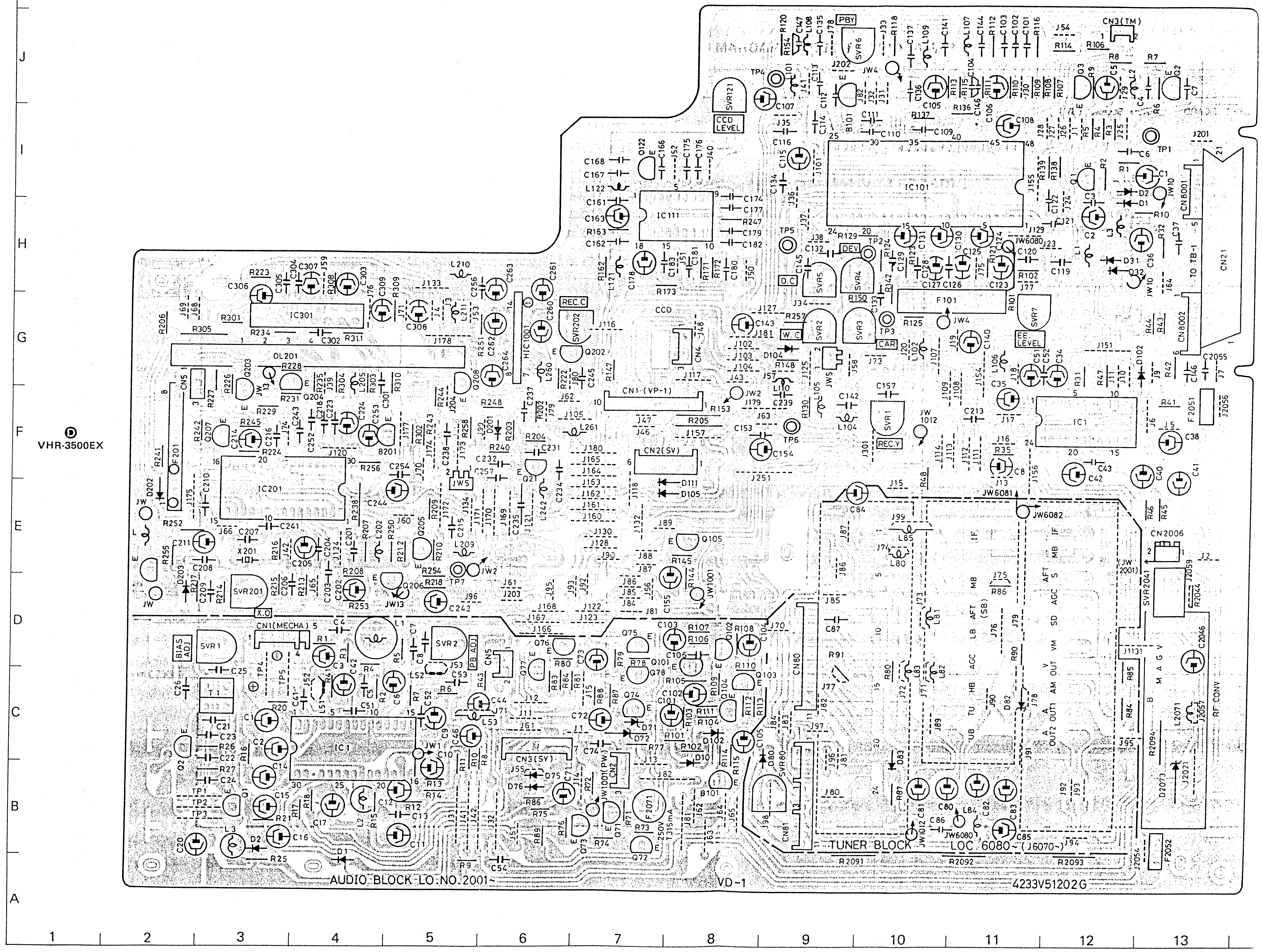
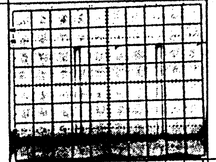
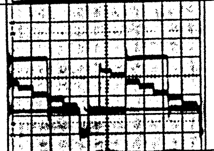
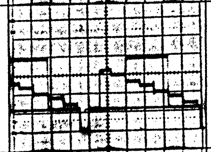
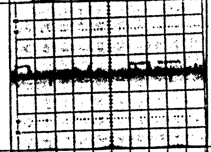
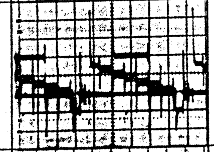
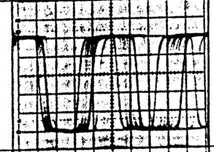
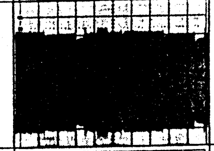
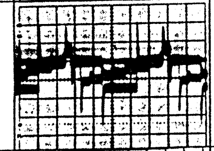
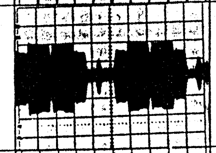
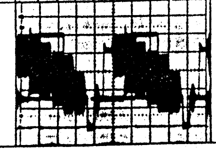
## P.C.B. VD-1 VIDEO, AUDIO & TUNER (143-0-233V-51202)

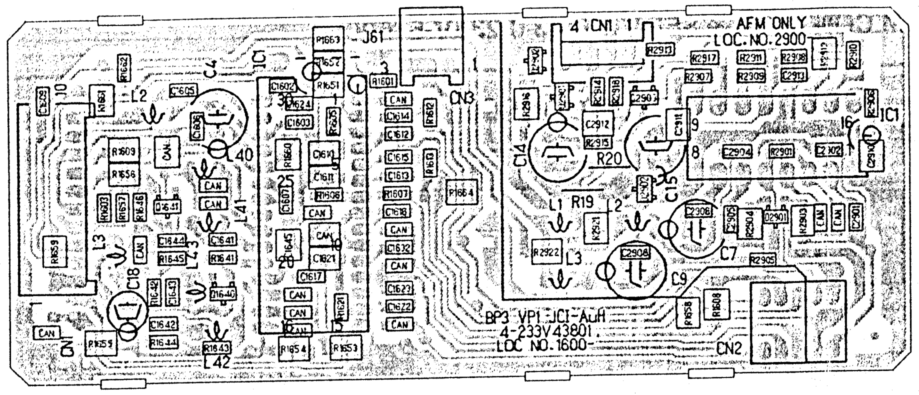

K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
IC101
IC111
IC201
IC301
IC1
HIC1001
DL201
F101
CN1 (VP-1)
CN2 (SV)
CN3 (TM)
CN21
CN8001
CN8002
TO TB-1
CN4
CN5
CN1 (MECHA)
CN3 (SV)
CN80
CN81
CN2006
CCD
CCD LEVEL
PBY
REC.C
EE LEVEL
REC.Y
DEV
W.C
CAR
D.C
SVR121
SVR202
SVR201
SVR1
SVR2
SVR3
SVR4
SVR5
SVR6
SVR7
SVR80
SVR2041
BIAS ADJ
PB ADJ
X.O
F2071
250V T315mA
F2051
F2052
RF CONV
M A G V
TUNER BLOCK
LOC 6080-(J6070-)
AUDIO BLOCK LO.NO.2001
VD-1
4233V51202G

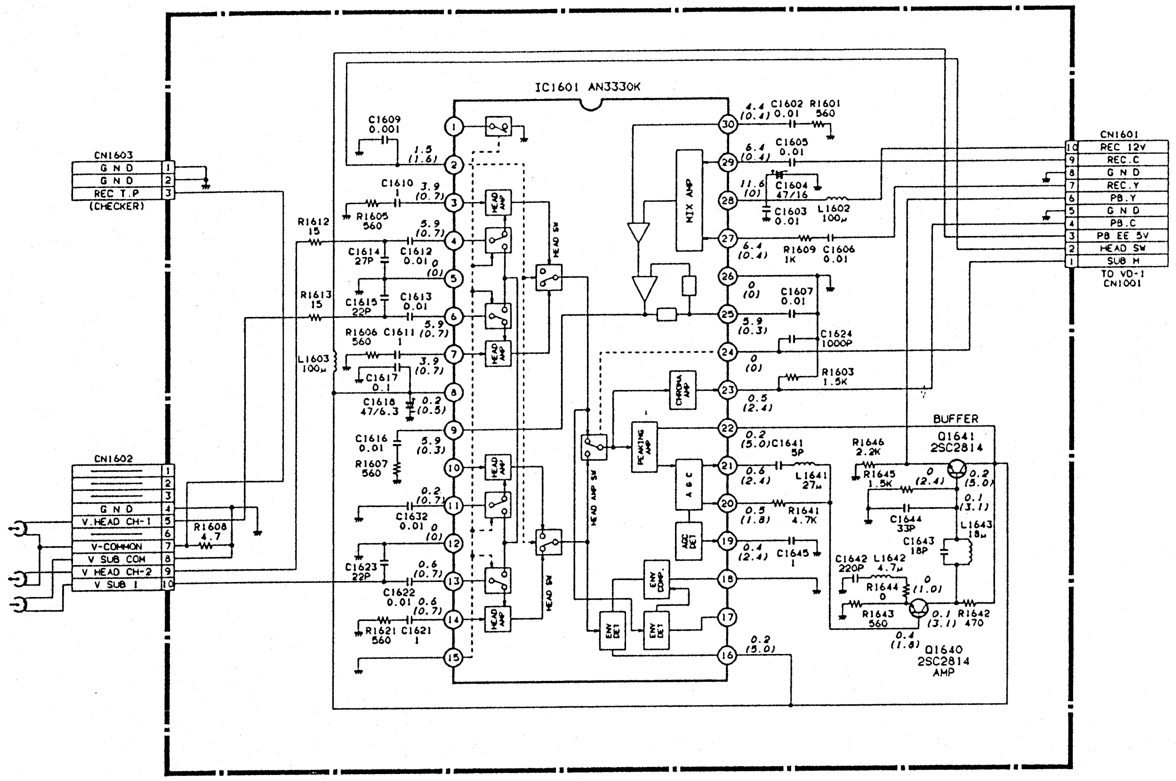
**D**
VHR-3500EX

## WAVEFORM OF VIDEO

| Pin No. | | |
|---|---|---|
| IC1101<br>(2) |  | 5 Vp-p<br>15.625 KHz |
| (8) |  | PLAY<br>500 m Vp-p |
| (8) |  | REC<br>500 m Vp-p |
| (10) (11) |  | PLAY<br>50 m Vp-p |
| (21) |  | REC<br>700 m Vp-p |
| (24) |  | REC<br>1 Vp-p |
| (25) |  | PLAY<br>400 m Vp-p |
| (35) |  | PLAY<br>300 m Vp-p |
| (43) |  | PLAY<br>400 m Vp-p |
| TP1001 |  | PLAY<br>1 Vp-p |

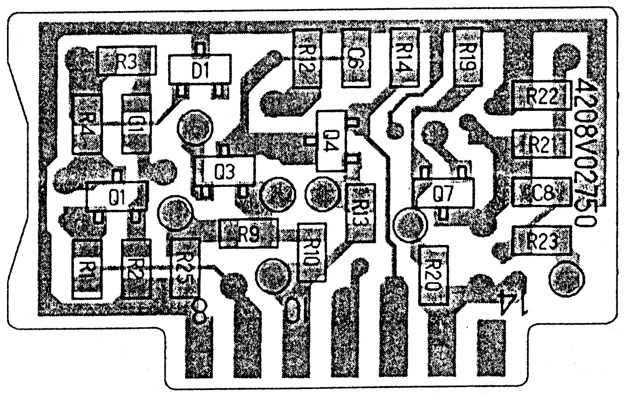
## P.C.B. VP-1 VIDEO PRE-AMP CIRCUIT & P.C.B. (143-0-233V-43801)


AFM ONLY
LOC.NO.2900
CN1
J61
CN3
IC1
L1
R19
R20
L3
C7
C9
C14
C15
C18
L2
L4
L41
CN2
BP3 VP1 IC1 AUH
4-233V43801
LOC NO.1600

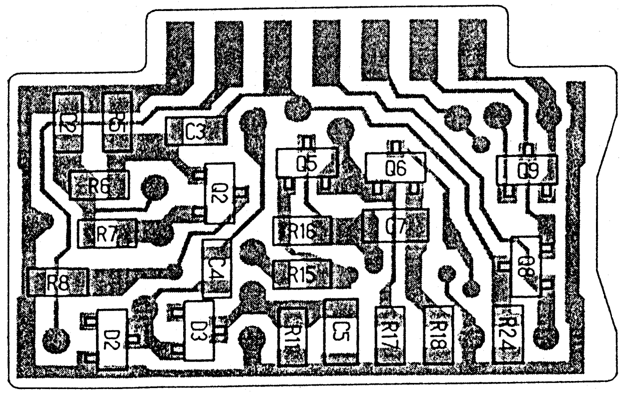

IC1601 AN3330K
CN1603
GND
GND
REC T.P
(CHECKER)
CN1602
GND
V.HEAD CH-1
V-COMMON
V SUB COM
V HEAD CH-2
V SUB 1
R1608 4.7
R1612 15
R1613 15
R1605 560
R1606 560
R1607 560
R1621 560
L1603 100μ
C1609 0.001
C1610 1
C1611 1
C1612 0.01
C1613 0.01
C1614 27P
C1615 22P
C1616 0.01
C1617 0.1
C1618 47/6.3
C1621 1
C1622 0.01
C1623 22P
C1632 0.01
HEAD AMP
HEAD SW
HEAD AMP SW
MIX AMP
CHROMA AMP
PEAKING AMP
AGC
AGC DET
ENV COMP.
ENV DET
C1602 0.01
R1601 560
C1605 0.01
C1604 47/16
C1603 0.01
L1602 100μ
R1609 1K
C1606 0.01
C1607 0.01
C1624 1000P
R1603 1.5K
C1641 5P
L1641 27μ
R1641 4.7K
C1645 1
BUFFER
Q1641 2SC2814
R1646 2.2K
R1645 1.5K
C1644 33P
L1643 18μ
C1643 18P
C1642 220P
L1642 4.7μ
R1644 0
R1643 560
R1642 470
Q1640 2SC2814 AMP
CN1601
REC 12V
REC.C
GND
REC.Y
PB.Y
GND
PB.C
PB EE 5V
HEAD SW
SUB H
TO VD-1 CN1001

Ⓔ
VHR-3500EX

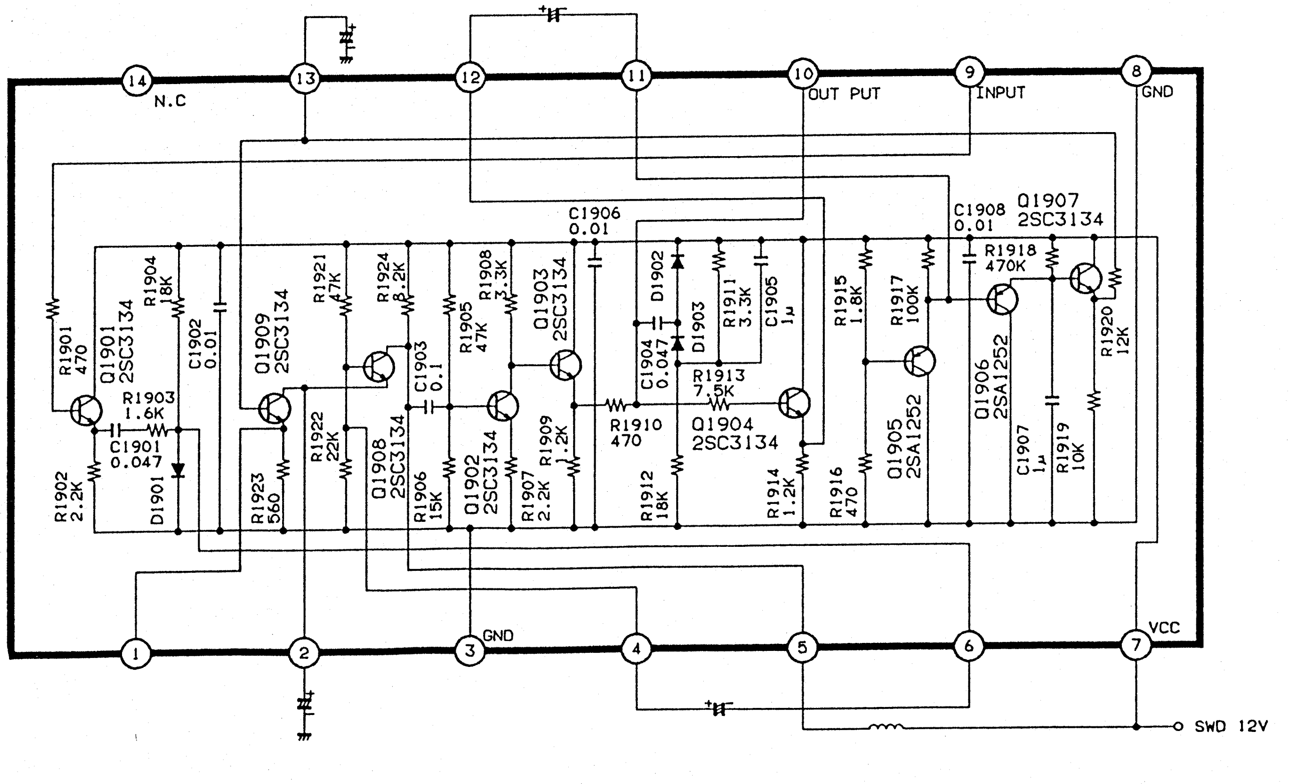
### SIDE A


R3
D1
R12
C6
R14
R19
R22
R21
C8
R23
R4
Q1
Q3
Q4
Q7
R9
R10
R13
R11
R2
R25
R20
4208V02750

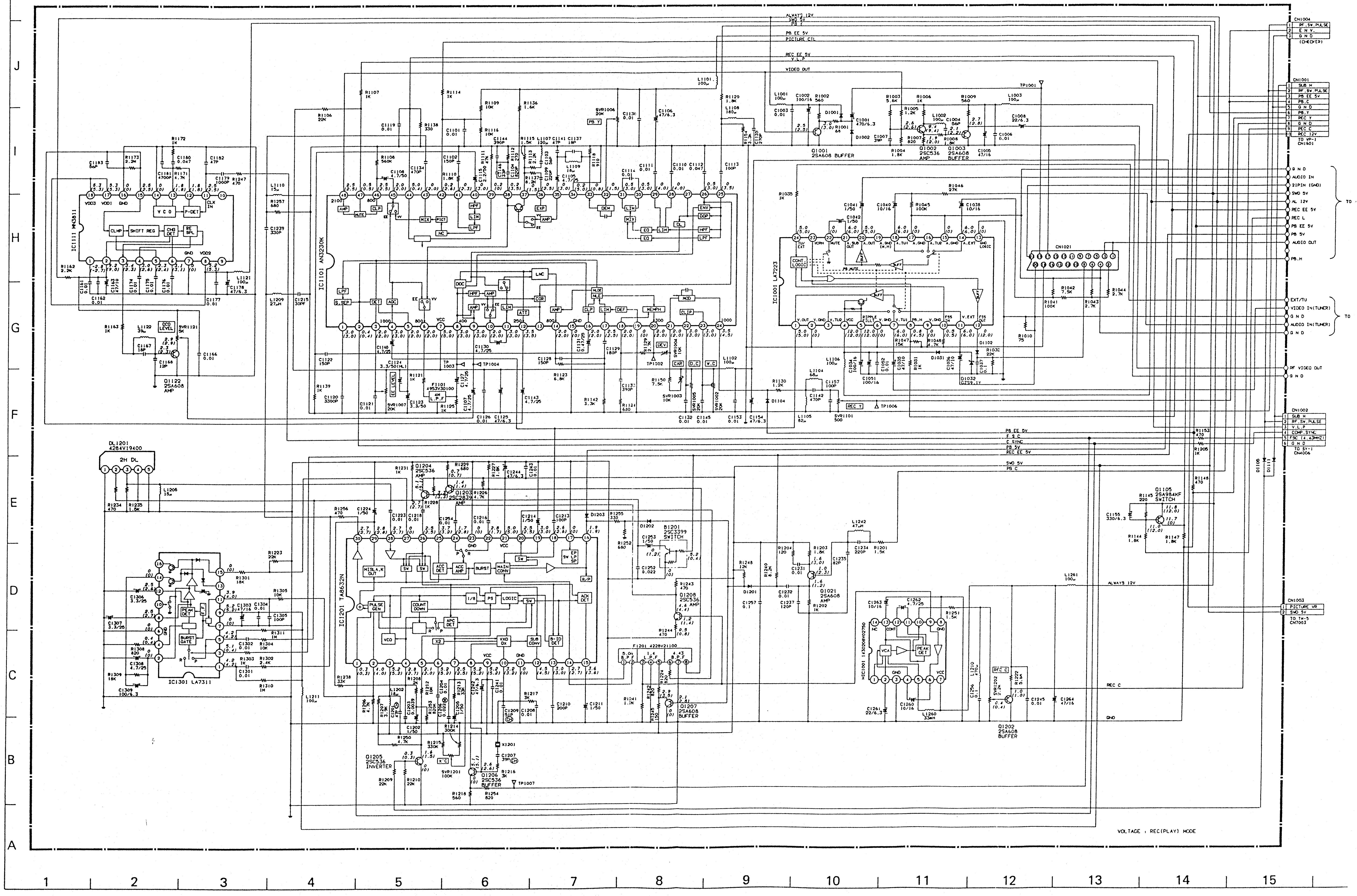
### SIDE B


C1
C3
Q5
Q6
Q9
Q2
R6
R7
R8
R16
R15
C4
D2
D3
R1
C5
R17
R18
R24

## HYBRID IC OF VIDEO CIRCUIT & P.C.B. (143-0-208V-02750)

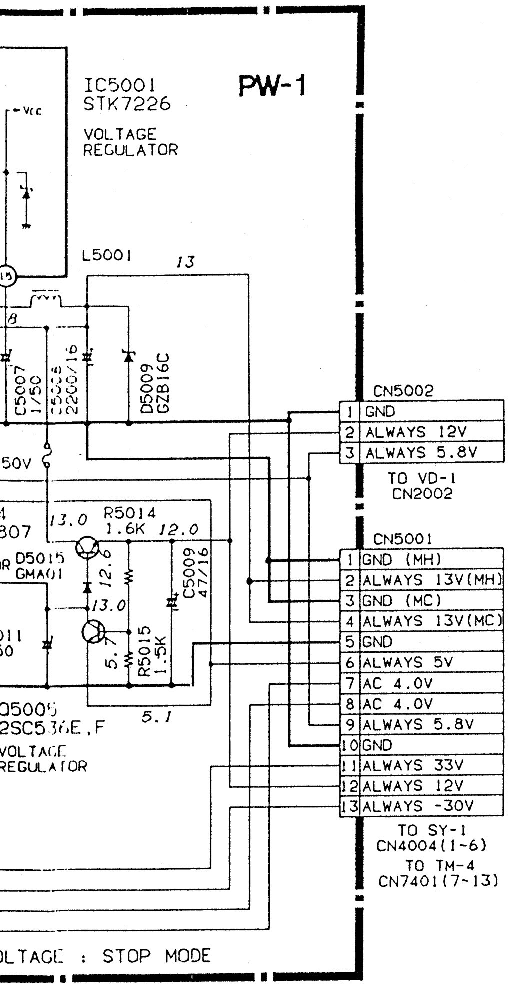

N.C
OUT PUT
INPUT
GND
GND
VCC
SWD 12V
R1901 470
Q1901 2SC3134
R1904 18K
C1902 0.01
R1903 1.6K
C1901 0.047
D1901
R1902 2.2K
Q1909 2SC3134
R1921 47K
R1924 8.2K
R1922 22K
R1923 560
Q1908 2SC3134
C1903 0.1
R1905 47K
R1906 15K
Q1902 2SC3134
R1908 3.3K
R1907 2.2K
R1909 1.2K
Q1903 2SC3134
C1906 0.01
D1902
D1903
C1904 0.047
R1911 3.3K
C1905 1μ
R1913 7.5K
R1910 470
R1912 18K
Q1904 2SC3134
R1914 1.2K
R1915 1.8K
R1916 470
R1917 100K
Q1905 2SA1252
C1908 0.01
Q1907 2SC3134
R1918 470K
Q1906 2SA1252
C1907 1μ
R1919 10K
R1920 12K

# P.C.B. VD-1 VIDEO CIRCUIT (143-0-233V-51202)

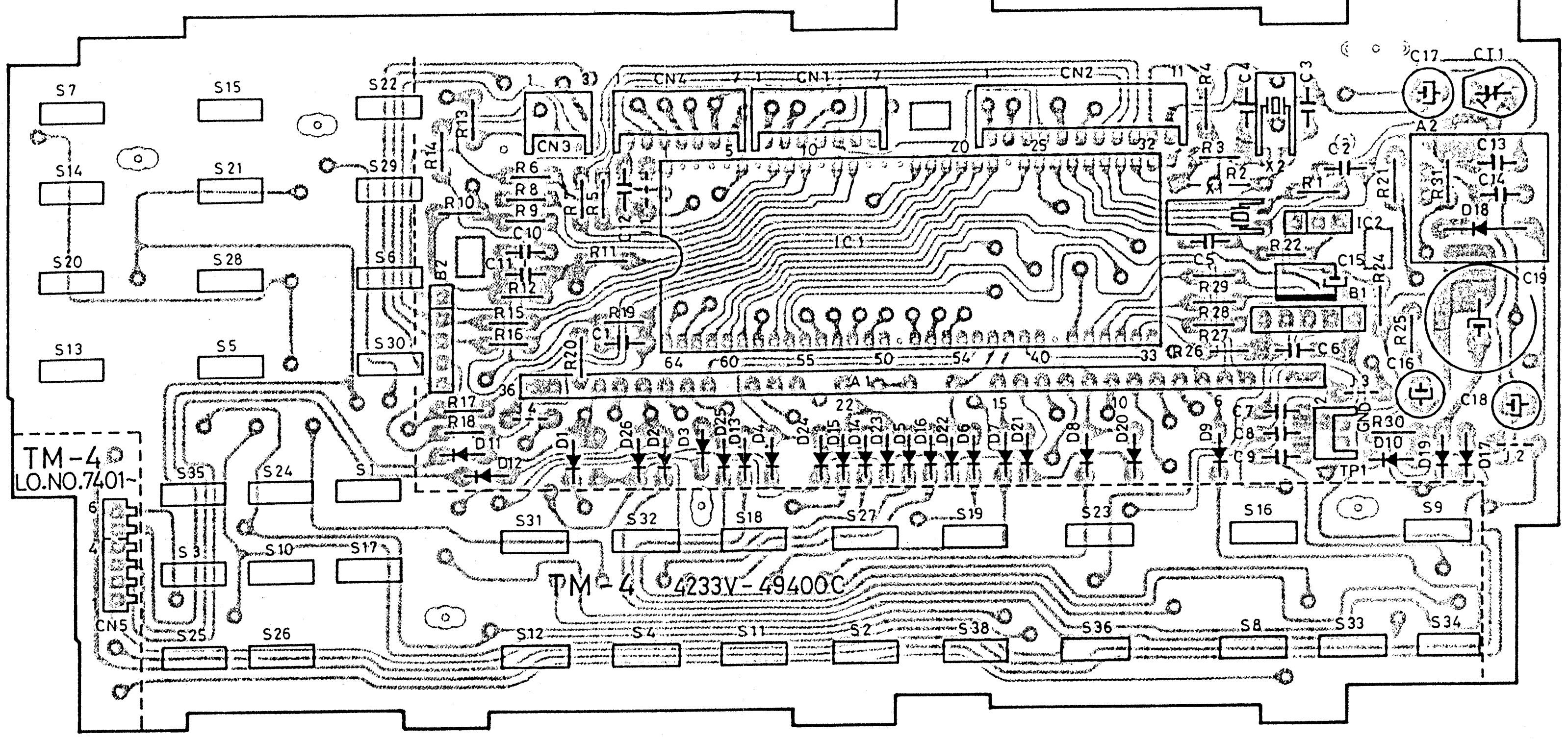


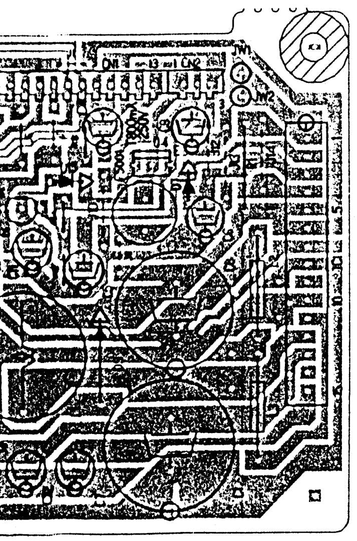
IC1111 MN3811
IC1101 AN3230K
IC1001 LA7223
IC1201 TA8632N
IC1301 LA7311
HIC1001 14302084Y02750
DL1201 4284V19400
2H DL
F1201 4226V21100
F1101 4953V30100
4M L.P.F
Q1001 2SA608 BUFFER
Q1002 2SC536 AMP
Q1003 2SA608 BUFFER
Q1122 2SA608 AMP
Q1204 2SC536 AMP
Q1203 2SC2839 AMP
Q1201 2SC3399 SWITCH
Q1208 2SC536 AMP
Q1021 2SA608 AMP
Q1207 2SA608 BUFFER
Q1205 2SC536 INVERTER
Q1206 2SC536 BUFFER
Q1202 2SA608 BUFFER
Q1105 2SA984KF SWITCH
CN1004
RF.SW.PULSE
ENV.
GND
(CHECKER)
CN1001
SUB H
RF.SW.PULSE
PB EE 5V
PB.C
GND
PB.Y
REC Y
GND
REC C
REC 12V
TO VP-1 CN1601
GND
AUDIO IN
21PIN (GND)
SWD 5V
AL 12V
REC EE 5V
REC L
PB EE 5V
PB 5V
AUDIO OUT
PB.H
TO
CN1021
EXT/TU
VIDEO IN(TUNER)
GND
AUDIO IN(TUNER)
GND
TO
RF VIDEO OUT
GND
CN1002
SUB H
RF.SW.PULSE
V.L.P
COMP.SYNC
FSC (4.43MHZ)
GND
TO SY-1 CN4006
CN1003
PICTURE VR
SWD 5V
TO TH-5 CN7003
ALWAYS 12V
SWD 5V
PB Y
PB EE 5V
PICTURE CTL
REC EE 5V
V.L.P
VIDEO OUT
PB EE 5V
FSC
C.SYNC
PB 5V
REC EE 5V
SWD 5V
PB C
REC C
GND
TP1001
TP1002
TP1003
TP1004
TP1006
TP1007
VOLTAGE : REC(PLAY) MODE
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

## 3V-43594)

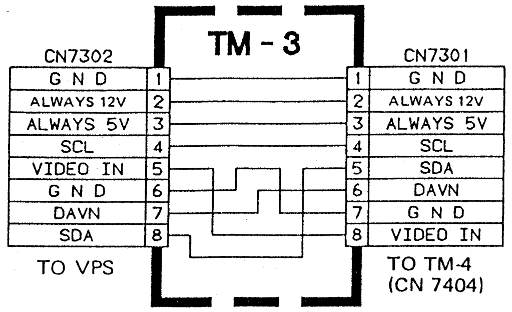

PW-1
IC5001
STK7226
VOLTAGE
REGULATOR
Vcc
L5001
13
8
C5007
1/50
C5008
2200/16
D5009
GZB16C
50V
13.0
R5014
1.6K
12.0
807
D5015
GMA01
12.6
13.0
C5009
47/16
011
50
5.7
R5015
1.5K
5.1
Q5005
2SC536E.F
VOLTAGE
REGULATOR
CN5002
1 GND
2 ALWAYS 12V
3 ALWAYS 5.8V
TO VD-1
CN2002
CN5001
1 GND (MH)
2 ALWAYS 13V(MH)
3 GND (MC)
4 ALWAYS 13V(MC)
5 GND
6 ALWAYS 5V
7 AC 4.0V
8 AC 4.0V
9 ALWAYS 5.8V
10 GND
11 ALWAYS 33V
12 ALWAYS 12V
13 ALWAYS -30V
TO SY-1
CN4004(1~6)
TO TM-4
CN7401(7~13)
OLTAGE : STOP MODE

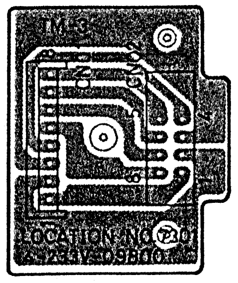
## P.C.B. TM-4 DISPLAY & TIMER (143-0-233V-49422)


TM-4
LO.NO.7401~
TM-4 4233V-49400C
IC1
IC2
CN1
CN2
CN3
CN4
CN5
S7
S15
S22
S14
S21
S29
S20
S28
S6
S13
S5
S30
S35
S24
S1
S3
S10
S17
S25
S26
S31
S32
S18
S27
S19
S23
S16
S9
S12
S4
S11
S2
S38
S36
S8
S33
S34
C17
C11
C13
C14
C19
C16
C18
D18
D10
TP1
X1
X2
B1
B2

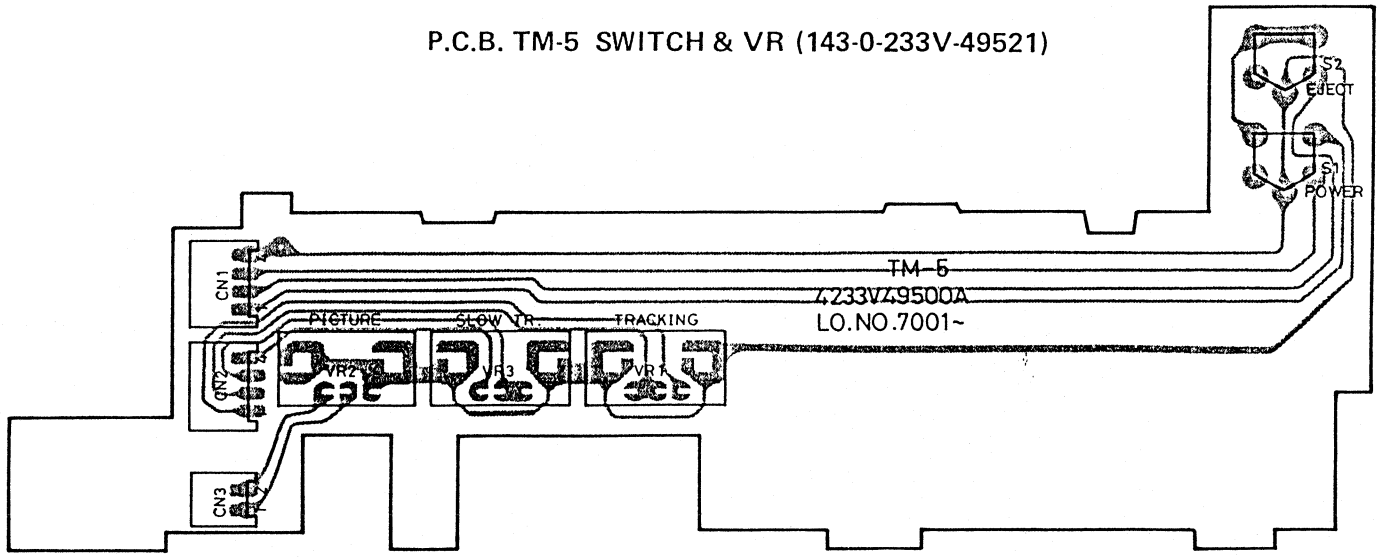


## P.C.B. TM-3 VPS CONNECTION CIRCUIT & P.C.B. (143-0-233V-09824)

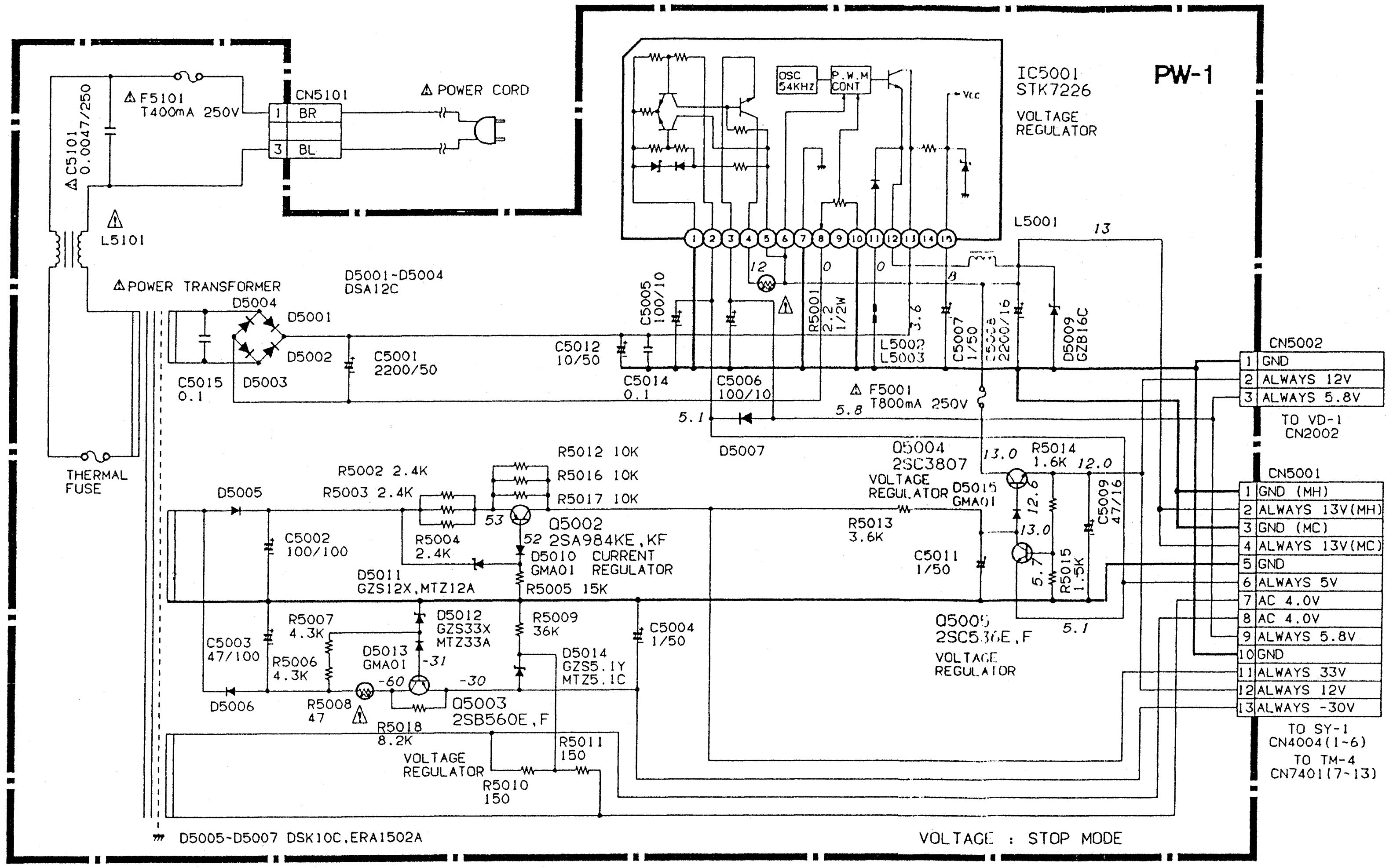

TM - 3
CN7302
1 G N D
2 ALWAYS 12V
3 ALWAYS 5V
4 SCL
5 VIDEO IN
6 G N D
7 DAVN
8 SDA
TO VPS
CN7301
1 G N D
2 ALWAYS 12V
3 ALWAYS 5V
4 SCL
5 SDA
6 DAVN
7 G N D
8 VIDEO IN
TO TM-4
(CN 7404)



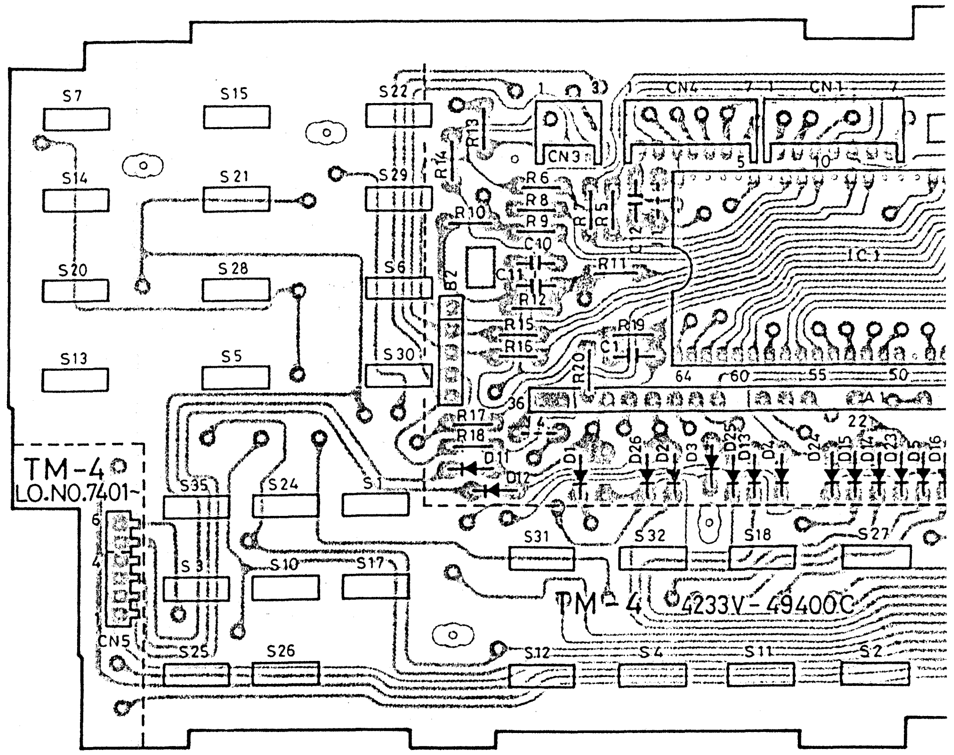
## P.C.B. TM-5 SWITCH & VR (143-0-233V-49521)

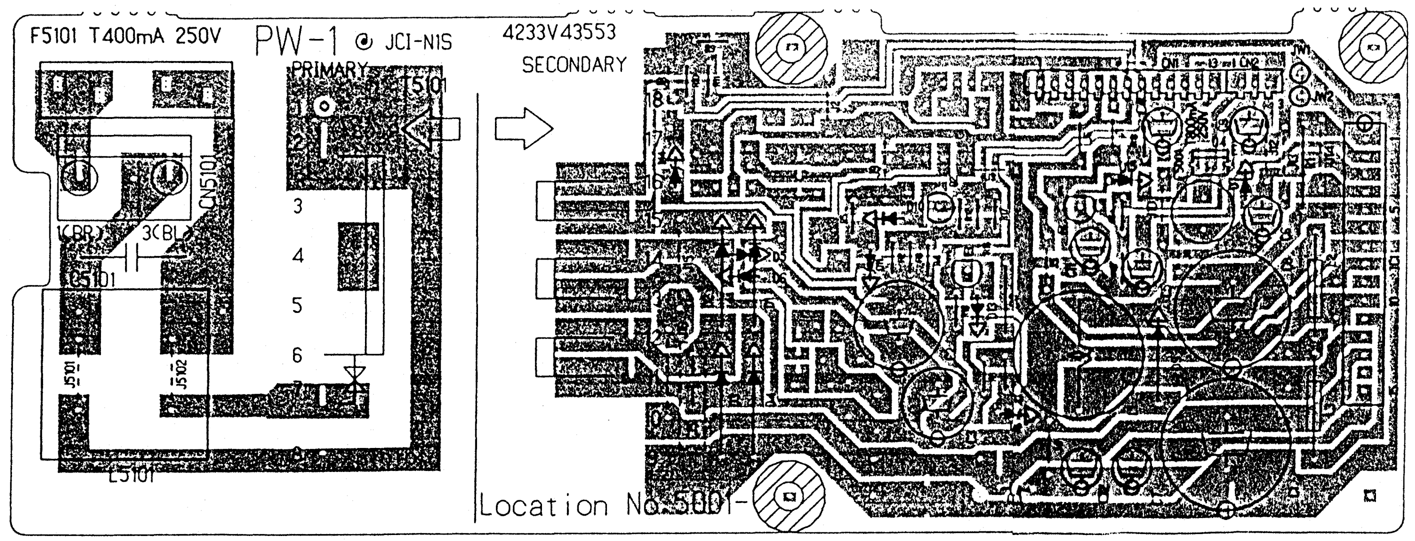

S2
EJECT
S1
POWER
TM-5
4233V49500A
LO.NO.7001~
CN1
CN2
CN3
PICTURE
SLOW TR.
TRACKING
VR2
VR3
VR1

## P.C.B. PW-1 POWER SUPPLY CIRCUIT & P.C.B. (143-0-233V-43594)

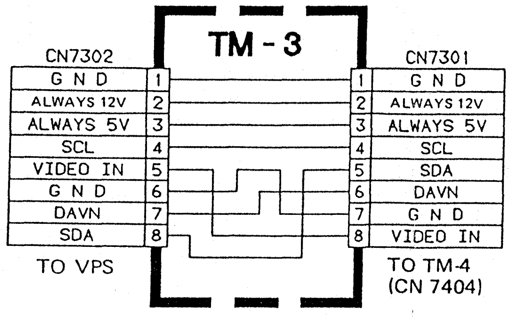

PW-1
IC5001
STK7226
VOLTAGE REGULATOR
OSC 54KHZ
P.W.M CONT
Vcc
Δ F5101
T400mA 250V
CN5101
1 BR
3 BL
Δ POWER CORD
Δ C5101
0.0047/250
L5101
Δ POWER TRANSFORMER
THERMAL FUSE
D5001-D5004
DSA12C
D5001
D5002
D5003
D5004
C5001
2200/50
C5015
0.1
C5012
10/50
C5005
100/10
C5014
0.1
C5006
100/10
R5001
2.2
1/2W
L5002
L5003
C5007
1/50
C5008
2200/16
D5009
GZB16C
L5001
Δ F5001
T800mA 250V
D5007
CN5002
1 GND
2 ALWAYS 12V
3 ALWAYS 5.8V
TO VD-1
CN2002
R5002 2.4K
R5003 2.4K
R5012 10K
R5016 10K
R5017 10K
R5004
2.4K
Q5002
2SA984KE,KF
D5010 CURRENT
GMA01 REGULATOR
D5011
GZS12X,MTZ12A
R5005 15K
D5005
C5002
100/100
Q5004
2SC3807
VOLTAGE REGULATOR
D5015
GMA01
R5014
1.6K
R5013
3.6K
C5011
1/50
C5009
47/16
R5015
1.5K
Q5005
2SC536E,F
VOLTAGE REGULATOR
C5003
47/100
R5007
4.3K
R5006
4.3K
D5012
GZS33X
MTZ33A
D5013
GMA01
R5009
36K
D5014
GZS5.1Y
MTZ5.1C
C5004
1/50
D5006
R5008
47
R5018
8.2K
Q5003
2SB560E,F
VOLTAGE REGULATOR
R5011
150
R5010
150
CN5001
1 GND (MH)
2 ALWAYS 13V(MH)
3 GND (MC)
4 ALWAYS 13V(MC)
5 GND
6 ALWAYS 5V
7 AC 4.0V
8 AC 4.0V
9 ALWAYS 5.8V
10 GND
11 ALWAYS 33V
12 ALWAYS 12V
13 ALWAYS -30V
TO SY-1
CN4004(1-6)
TO TM-4
CN7401(7-13)
D5005-D5007 DSK10C,ERA1502A
VOLTAGE : STOP MODE
13
12
0
8
5.1
5.8
13.0
12.0
5.7
5.1
-31
-60
-30
53
52

## P.C.B. TM-4 DISPLAY & TIMER (143-0-


TM-4
LO.NO.7401-
TM-4 4233V-49400C
CN1
CN3
CN4
CN5
IC1
S7
S15
S22
S14
S21
S29
S20
S28
S6
S13
S5
S30
S35
S24
S1
S3
S10
S17
S31
S32
S18
S27
S25
S26
S12
S4
S11
S2
R6
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
C10
C11
D1
D12


F5101 T400mA 250V
PW-1 JCI-NIS
PRIMARY
4233V43553
SECONDARY
CN5101
1(BR)
3(BL)
C5101
L5101
3
4
5
6
Location No.5001-

## P.C.B. TM-3 VPS CONNECTION CIRCUIT & P.C.B. (143-0-233V-09824)


TM-3

CN7302

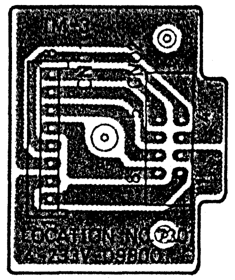
| | |
|---|---|
| G N D | 1 |
| ALWAYS 12V | 2 |
| ALWAYS 5V | 3 |
| SCL | 4 |
| VIDEO IN | 5 |
| G N D | 6 |
| DAVN | 7 |
| SDA | 8 |

TO VPS

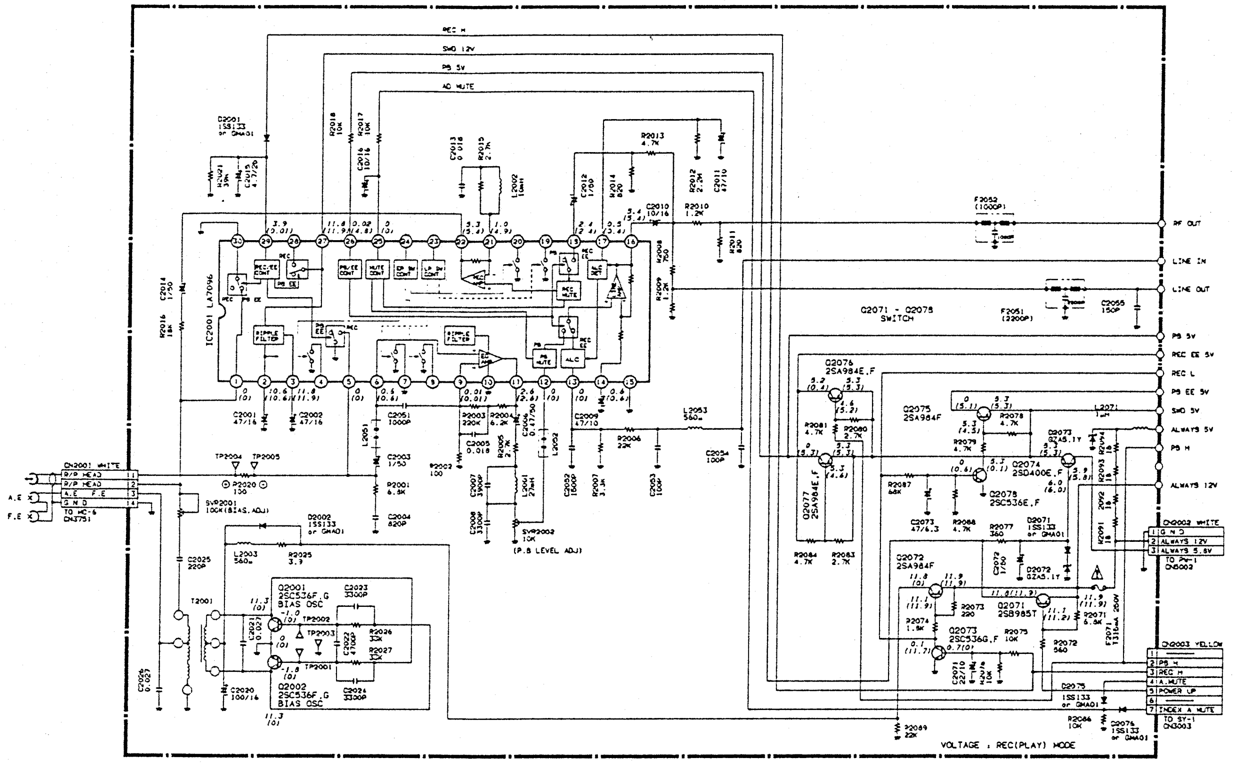
CN7301

| | |
|---|---|
| 1 | G N D |
| 2 | ALWAYS 12V |
| 3 | ALWAYS 5V |
| 4 | SCL |
| 5 | SDA |
| 6 | DAVN |
| 7 | G N D |
| 8 | VIDEO IN |

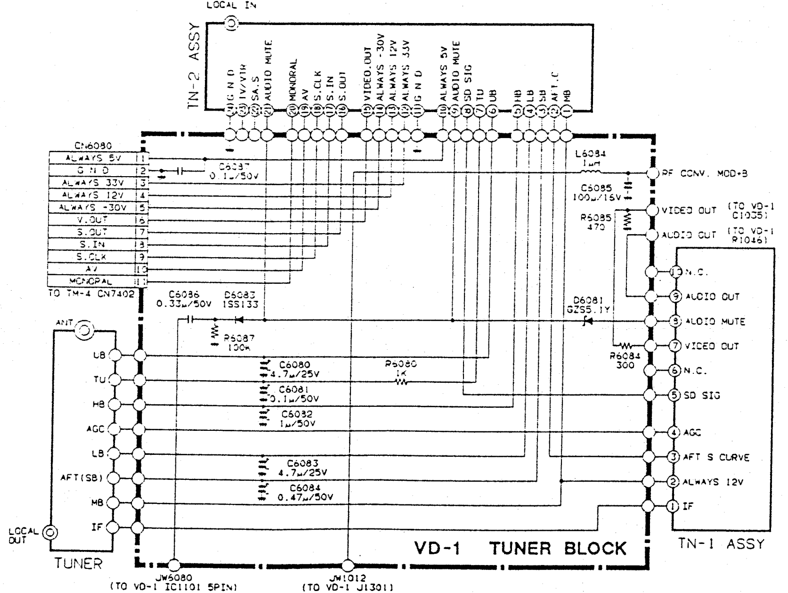
TO TM-4
(CN 7404)


TM-3
LOCATION NO.7301

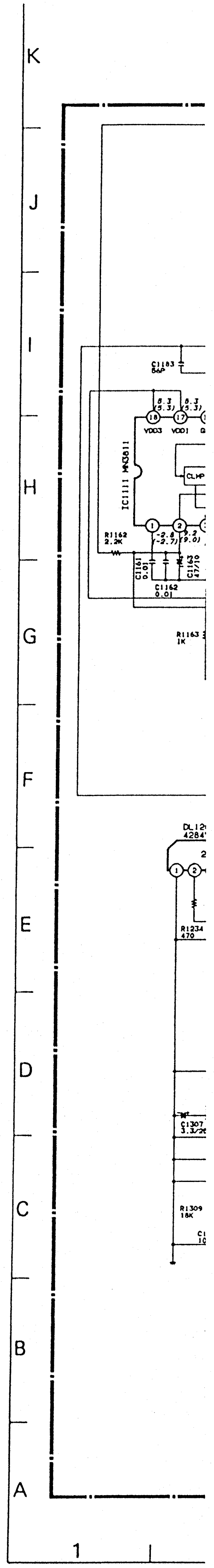
## P.C.B. VD-1 AUDIO CIRCUIT (143-0-233V-51202)


REC H
SWD 12V
PB 5V
AD MUTE
IC2001 LA7096
Q2001 2SC536F,G BIAS OSC
Q2002 2SC536F,G BIAS OSC
T2001
CN2001 WHITE
R/P HEAD
R/P HEAD
A.E F.E
G N D
TO HC-6 CN3751
A.E
F.E
SVR2001 10K(BIAS ADJ)
SVR2002 10K (P.B LEVEL ADJ)
TP2004
TP2005
Q2071 - Q2078 SWITCH
Q2076 2SA984E,F
Q2075 2SA984F
Q2077 2SA984E,F
Q2074 2SD400E,F
Q2078 2SC536E,F
Q2072 2SA984F
Q2071 2SB985T
Q2073 2SC536G,F
D2071 1SS133 or GMA01
D2072 GZA5.1T
D2073 GZA5.1T
D2075 1SS133 or GMA01
D2076 1SS133 or GMA01
F2051 (2200P)
F2052 (1000P)
RF OUT
LINE IN
LINE OUT
PB 5V
REC EE 5V
REC L
PB EE 5V
SWD 5V
ALWAYS 5V
PB H
ALWAYS 12V
CN6002 WHITE
G N D
ALWAYS 12V
ALWAYS 5.8V
TO PW-1 CN5002
CN6003 YELLOW
PB H
REC H
A.MUTE
POWER UP
INDEX A MUTE
TO SY-1 CN3003
VOLTAGE : REC(PLAY) MODE

## P.C.B. VD-1 TUNER CIRCUIT (143-0-233V-51202)

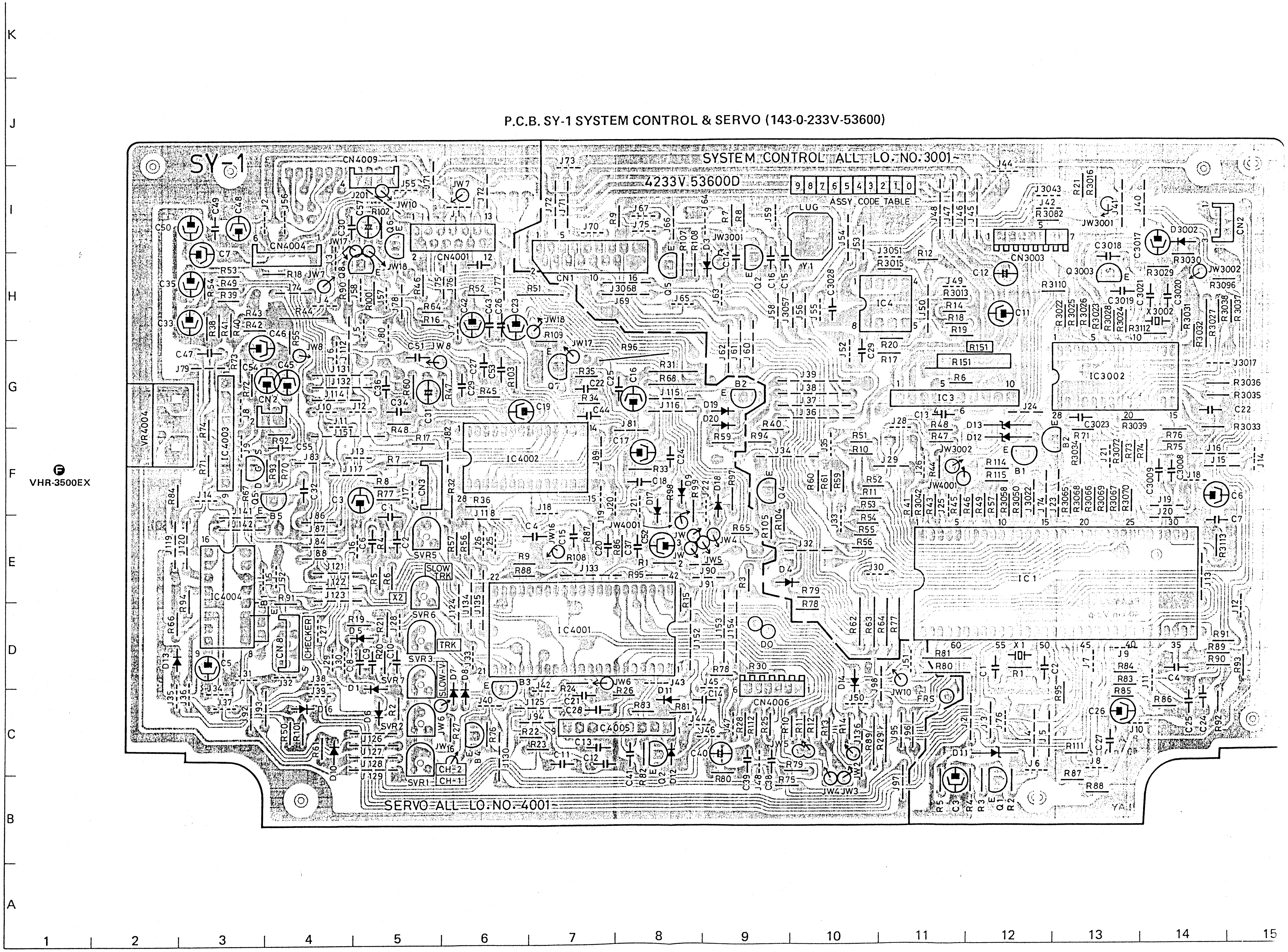

LOCAL IN
TN-2 ASSY
G N D
1V/1H
SA.S
AUDIO MUTE
MONORAL
AV
S.CLK
S.IN
S.OUT
VIDEO OUT
ALWAYS -30V
ALWAYS 12V
ALWAYS 33V
G N D
ALWAYS 5V
AUDIO MUTE
SD SIG
TU
UB
HB
LB
SB
AFT.C
MB
CN6080
ALWAYS 5V
G N D
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
V.OUT
S.OUT
S.IN
S.CLK
AV
MONORAL
TO TM-4 CN7402
C6087 0.1μ/50V
L6084 1μH
RF CONV. MOD-B
C6085 100μ/16V
R6085 470
VIDEO OUT (TO VD-1 C1035)
AUDIO OUT (TO VD-1 R1046)
C6086 0.33μ/50V
D6083 1SS133
D6081 GZS5.1Y
R6087 100K
R6084 300
C6080 4.7μ/25V
R6080 1K
C6081 0.1μ/50V
C6082 1μ/50V
C6083 4.7μ/25V
C6084 0.47μ/50V
ANT
LB
TU
HB
AGC
LB
AFT(SB)
MB
IF
LOCAL OUT
TUNER
N.C.
AUDIO OUT
AUDIO MUTE
VIDEO OUT
N.C.
SD SIG
AGC
AFT S CURVE
ALWAYS 12V
IF
TN-1 ASSY
VD-1 TUNER BLOCK
JW6080 (TO VD-1 IC1101 5PIN)
JW1012 (TO VD-1 J1301)

14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23


K
J
I
H
G
F
E
D
C
B
A
1
IC1111 MN3611
VDD3
VDD1
VDD2
R1162 2.2K
C1161 0.01
C1162 0.01
C1163
R1163 1K
R1234 470
R1309 18K
C1307

**F** VHR-3500EX

## P.C.B. SY-1 SYSTEM CONTROL & SERVO (143-0-233V-53600)


SY-1
SYSTEM CONTROL ALL LO. NO. 3001
4233V 53600D
9 8 7 6 5 4 3 2 1 0
ASSY CODE TABLE
SERVO ALL LO. NO. 4001
IC1
IC3
IC4
IC3002
IC4001
IC4002
IC4003
IC4004
IC4005
CN1
CN2
CN3
CN8
CN3003
CN4001
CN4004
CN4006
CN4009
VR4004
CHECKER
SLOW TRK
TRK
SLOW-V
CH-2
CH-1
SVR1
SVR2
SVR3
SVR5
SVR6
SVR7
LUG
Y1
X1
X2
X3002
FRS
DO
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
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6
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13
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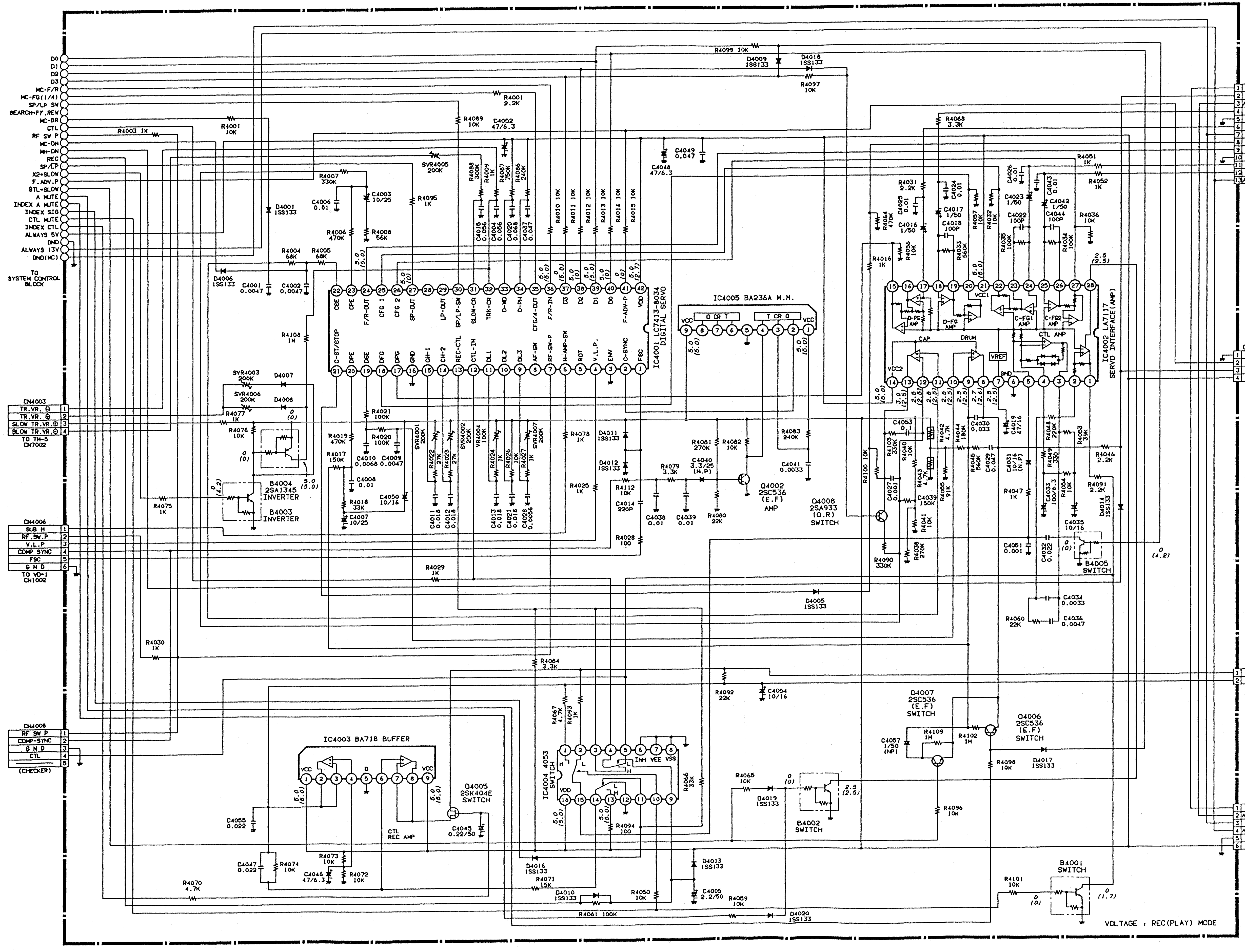
15

## P.C.B. SY-1 SERVO CIRCUIT (143-0-233V-53600)


D0
D1
D2
D3
MC-F/R
MC-FG(1/4)
SP/LP SW
SEARCH+FF.REW
MC-BR
CTL
RF SW P
MC-ON
MH-ON
REC
SP/LP
X2+SLOW
F.ADV.P
STL+SLOW
A MUTE
INDEX A MUTE
INDEX SIG
CTL MUTE
INDEX CTL
ALWAYS 5V
GND
ALWAYS 13V
GND(MC)
TO SYSTEM CONTROL BLOCK
CN4003
TR.VR. ⊖
TR.VR. ⊕
SLOW TR.VR.⊕
SLOW TR.VR.⊖
TO TH-5 CN7002
CN4006
SUB H
RF.SW.P
V.L.P
COMP SYNC
FSC
G N D
TO VO-1 CN1002
CN4008
RF SW P
COMP-SYNC
G N D
CTL
(CHECKER)
IC4001 LC7413-8034 DIGITAL SERVO
IC4005 BA236A M.M.
IC4002 LA7117 SERVO INTERFACE(AMP)
IC4003 BA718 BUFFER
IC4004 4053 SWITCH
B4004 2SA1345 INVERTER
B4003 INVERTER
Q4002 2SC536 (E.F) AMP
Q4008 2SA933 (Q.R) SWITCH
Q4005 2SK404E SWITCH
Q4007 2SC536 (E.F) SWITCH
Q4006 2SC536 (E.F) SWITCH
B4002 SWITCH
B4001 SWITCH
B4005 SWITCH
CN4001
GND(MH)
MH-SERVO
ALWAYS 13V(MH)
MH-FG
GND
MH-PG
GND(MC)
MC-SERVO
MC-F/R
GND(MC-FG)
MC-FG1
MC-FG2
ALWAYS 13V(MC)
TO MC-2 CN3557
CN4009
GND
F ADV P
H SLOW P
ALWAYS 5V
CN4301
CN4002
CTL ⊕
CTL ⊖
TO MC-6 CN3751
CN4004
GND (MH)
ALWAYS 13V(MH)
GND (MC)
ALWAYS 13V(MC)
GND
ALWAYS 5V
TO PW-1 CN5001
VOLTAGE : REC(PLAY) MODE
16
17
18
19
20
21
22
23
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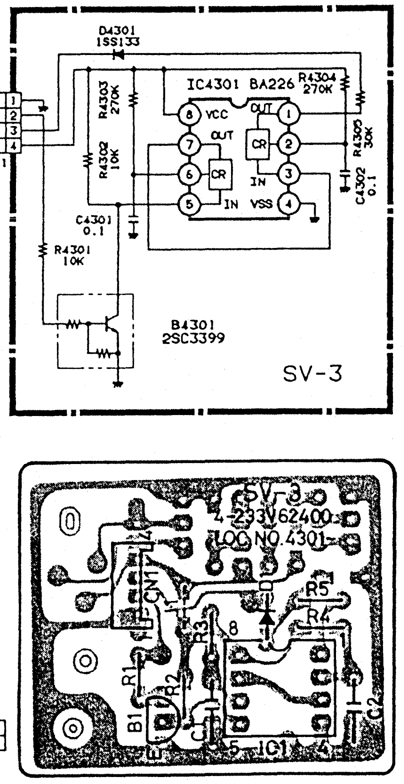
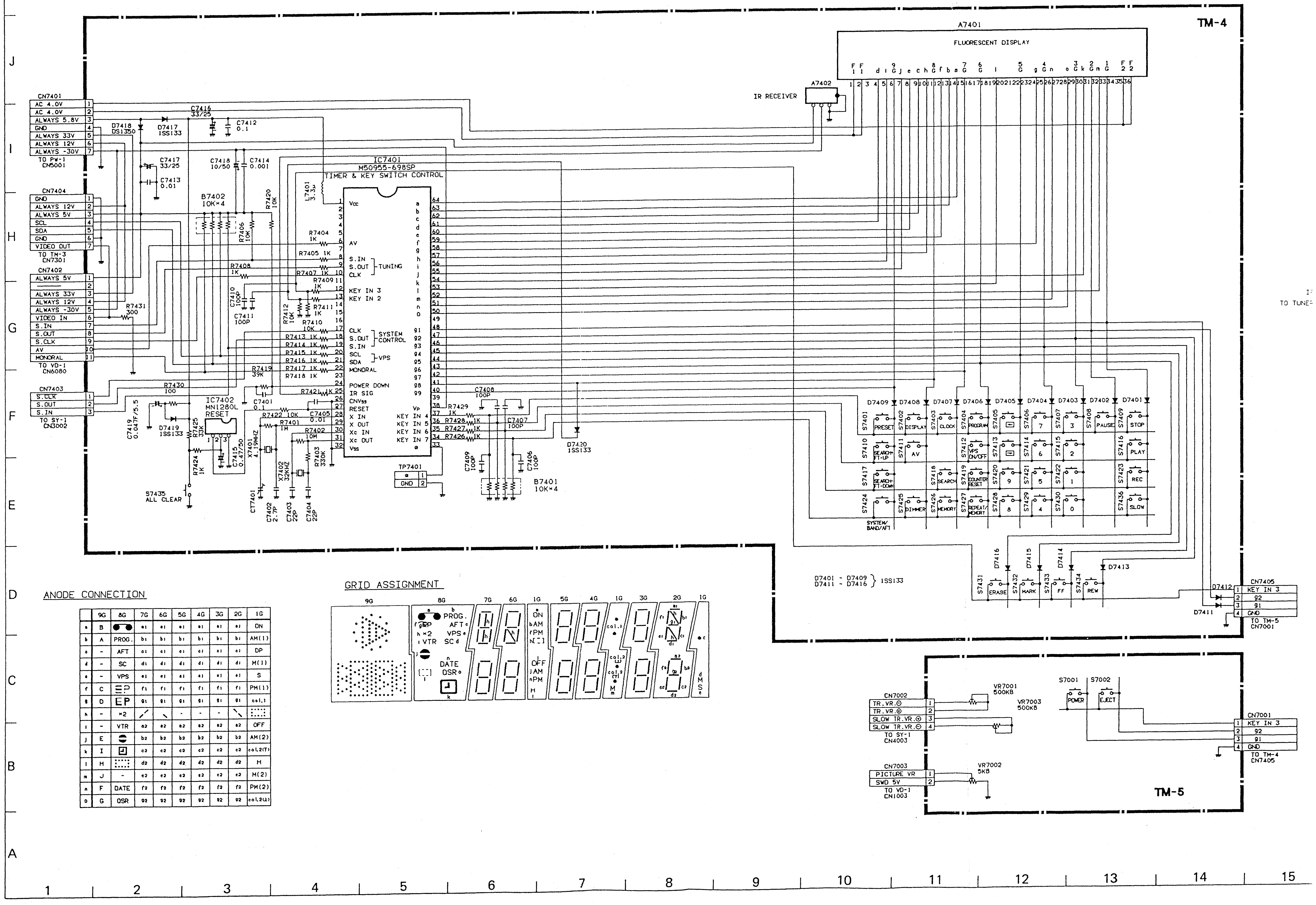
31

## P.C.B. SV-3 SERVO CIRCUIT & P.C.B.
## (143-0-233V-62400)


D4301 1SS133
IC4301 BA226
B4301 2SC3399
SV-3
SV-3
4-233V62400
LOC NO.4301

| HEX | D3 | D2 | D1 | D0 | MODE |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | STOP |
| 1 | 0 | 0 | 0 | 1 | FRONT LOAD |
| 2 | 0 | 0 | 1 | 0 | TAPE LOAD |
| 3 | 0 | 0 | 1 | 1 | FF+REW |
| 4 | 0 | 1 | 0 | 0 | SP★ SPEED1 |
| 5 | 0 | 1 | 0 | 1 | SP★ SPEED2 |
| 6 | 0 | 1 | 1 | 0 | EP★ X1 |
| 7 | 0 | 1 | 1 | 1 | REC |
| 8 | 1 | 0 | 0 | 0 | EDIT |
| 9 | 1 | 0 | 0 | 1 | PB NOR 1 |
| A | 1 | 0 | 1 | 0 | PB NOR 2 |
| B | 1 | 0 | 1 | 1 | PBX2 |
| C | 1 | 1 | 0 | 0 | SEARCH SPX5 |
| D | 1 | 1 | 0 | 1 | SEARCH SPX9 |
| E | 1 | 1 | 1 | 0 | SLOW 1 |
| F | 1 | 1 | 1 | 1 | SLOW 2 |

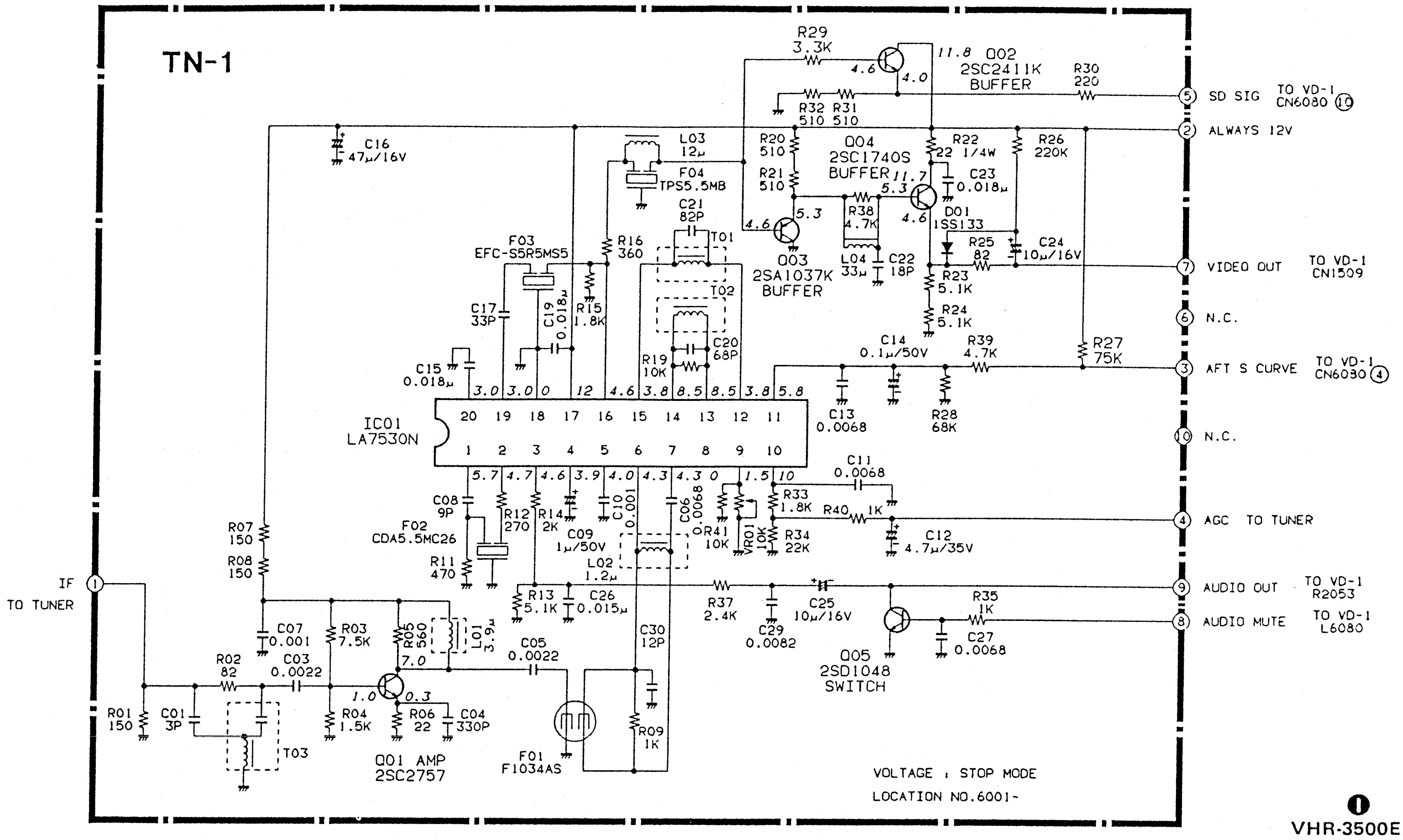
# P.C.B. TM-4 DISPLAY & TIMER CIRCUIT (143-0-233V-49422)
# P.C.B. TM-5 SWITCH & VR CIRCUIT (143-0-233V-49521)


TM-4
A7401
FLUORESCENT DISPLAY
A7402
IR RECEIVER
CN7401
AC 4.0V
AC 4.0V
ALWAYS 5.8V
GND
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
TO PW-1 CN5001
CN7404
GND
ALWAYS 12V
ALWAYS 5V
SCL
SDA
GND
VIDEO OUT
TO TM-3 CN7301
CN7402
ALWAYS 5V
ALWAYS 33V
ALWAYS 12V
ALWAYS -30V
VIDEO IN
S.IN
S.OUT
S.CLK
AV
MONORAL
TO VD-1 CN6080
CN7403
S.CLK
S.OUT
S.IN
TO SY-1 CN3002
IC7401
M50955-698SP
TIMER & KEY SWITCH CONTROL
IC7402
MN1280L
RESET
S7435
ALL CLEAR
TP7401
D7401 - D7409
D7411 - D7416 } 1SS133
CN7405
KEY IN 3
TO TM-5 CN7001
PRESET
DISPLAY
CLOCK
PROGRAM
STOP
PAUSE
PLAY
REC
SLOW
SEARCH FF-UP
SEARCH FF-DOWN
AV
VPS ON/OFF
SEARCH
COUNTER RESET
DIMMER
MEMORY
REPEAT/MEMORY
SYSTEM/BAND/AFT
ERASE
MARK
FF
REW
TO TUNER
GRID ASSIGNMENT
TM-5
CN7002
TR.VR.⊕
TR.VR.⊖
SLOW TR.VR.⊕
SLOW TR.VR.⊖
TO SY-1 CN4003
VR7001 500KB
VR7003 500KB
S7001 POWER
S7002 EJECT
CN7001
KEY IN 3
GND
TO TM-4 CN7405
CN7003
PICTURE VR
SWD 5V
TO VD-1 CN1003
VR7002 5KB
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

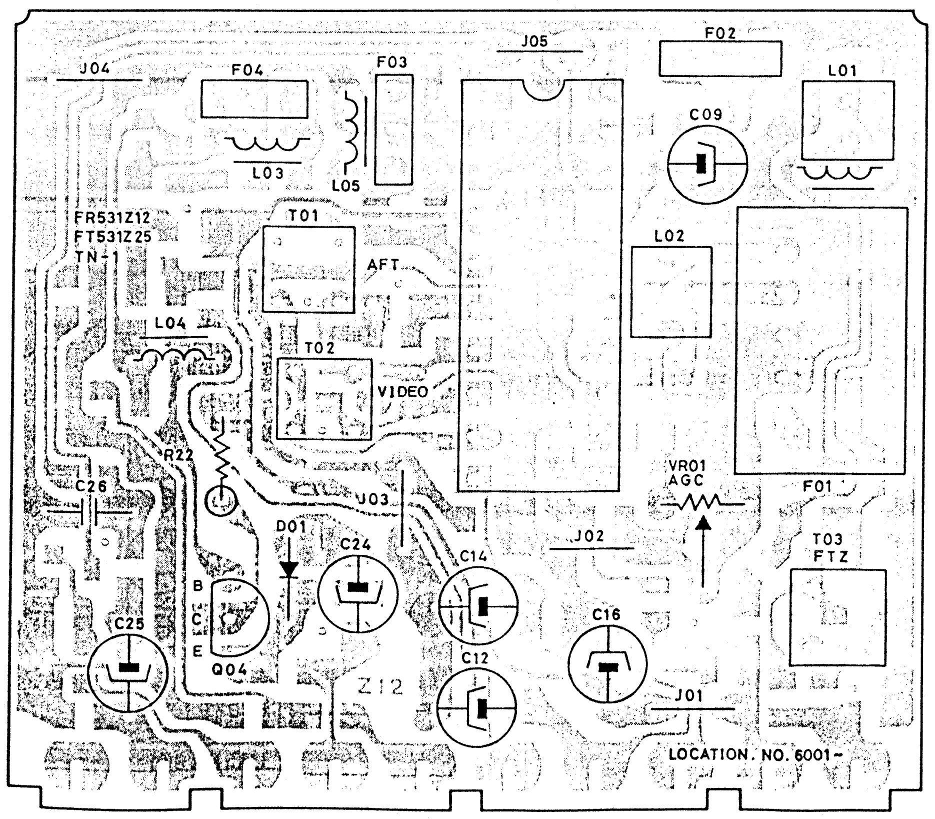
## ANODE CONNECTION

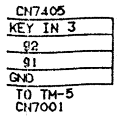
|  | 9G | 8G | 7G | 6G | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|---|---|---|---|
| a | B | ●‿● | a1 | a1 | a1 | a1 | a1 | a1 | ON |
| b | A | PROG. | b1 | b1 | b1 | b1 | b1 | b1 | AM(1) |
| c | - | AFT | c1 | c1 | c1 | c1 | c1 | c1 | DP |
| d | - | SC | d1 | d1 | d1 | d1 | d1 | d1 | M(1) |
| e | - | VPS | e1 | e1 | e1 | e1 | e1 | e1 | S |
| f | C | EP | f1 | f1 | f1 | f1 | f1 | f1 | PM(1) |
| g | D | EP | g1 | g1 | g1 | g1 | g1 | g1 | col.1 |
| h | - | ×2 | / | \ | - | - | - | \ | ⬚ |
| i | - | VTR | a2 | a2 | a2 | a2 | a2 | a2 | OFF |
| j | E | ⊖ | b2 | b2 | b2 | b2 | b2 | b2 | AM(2) |
| k | I | ⊡ | c2 | c2 | c2 | c2 | c2 | c2 | col.2(T) |
| l | H | ⬚ | d2 | d2 | d2 | d2 | d2 | d2 | H |
| m | J | - | e2 | e2 | e2 | e2 | e2 | e2 | M(2) |
| n | F | DATE | f2 | f2 | f2 | f2 | f2 | f2 | PM(2) |
| o | G | OSR | g2 | g2 | g2 | g2 | g2 | g2 | col.2(L) |

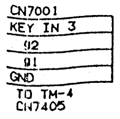
## P.C.B. TN-1 TUNER IF CIRCUIT & P.C.B. (143-9-4300-83300)


TN-1
IF TO TUNER
IC01 LA7530N
Q01 AMP 2SC2757
Q02 2SC2411K BUFFER
Q03 2SA1037K BUFFER
Q04 2SC1740S BUFFER
Q05 2SD1048 SWITCH
D01 1SS133
F01 F1034AS
F02 CDA5.5MC26
F03 EFC-S5R5MS5
F04 TPS5.5MB
T01
T02
T03
L01 3.9μ
L02 1.2μ
L03 12μ
L04 33μ
VR01 10K
SD SIG TO VD-1 CN6080 ⑩
ALWAYS 12V
VIDEO OUT TO VD-1 CN1509
N.C.
AFT S CURVE TO VD-1 CN6080 ④
N.C.
AGC TO TUNER
AUDIO OUT TO VD-1 R2053
AUDIO MUTE TO VD-1 L6080
VOLTAGE : STOP MODE
LOCATION NO.6001-

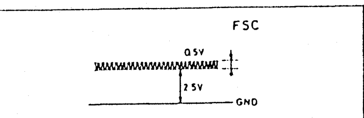
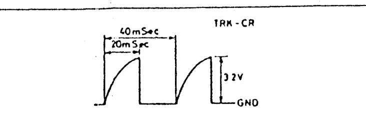
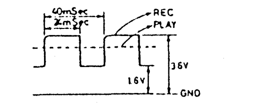
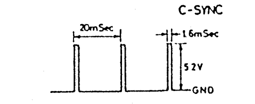
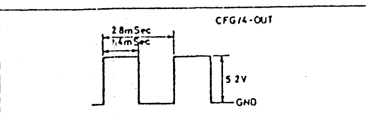
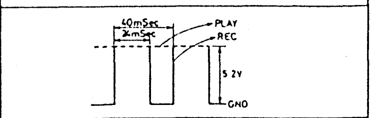
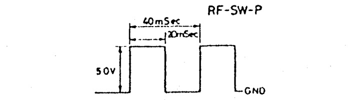
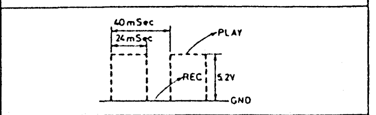
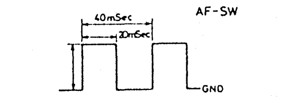
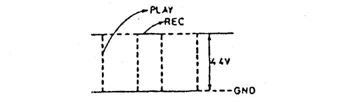
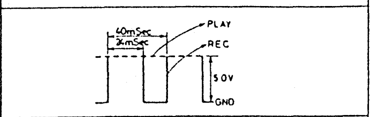
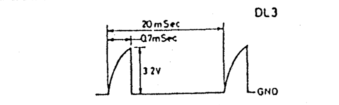
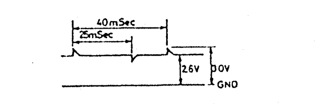
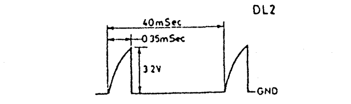
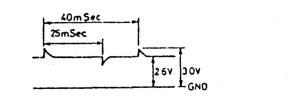
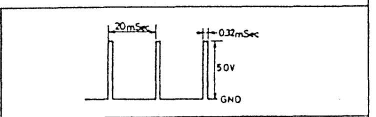
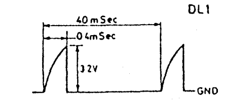
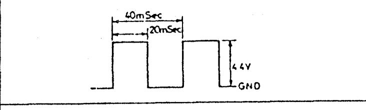
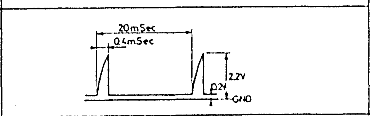
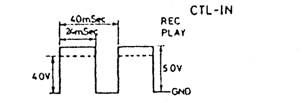
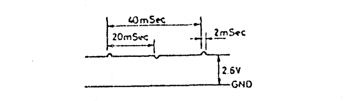
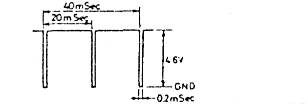
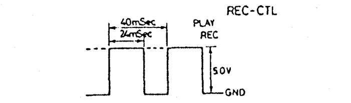
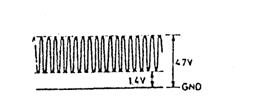
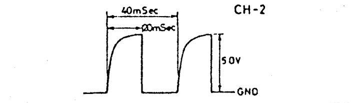
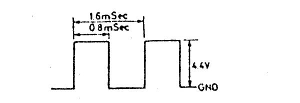
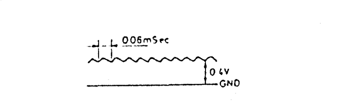
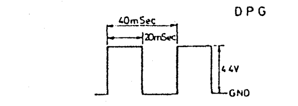
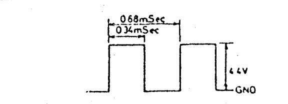
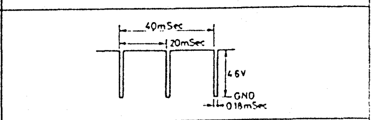
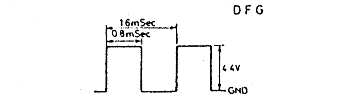
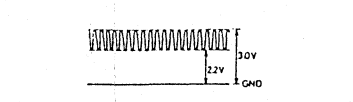
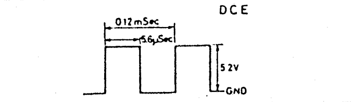
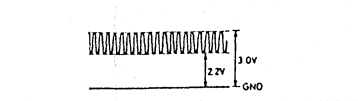
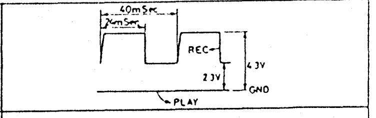
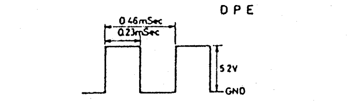
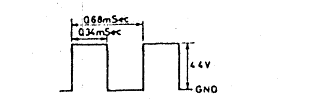
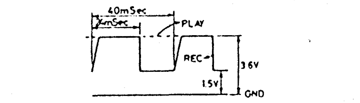
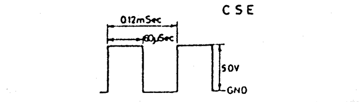
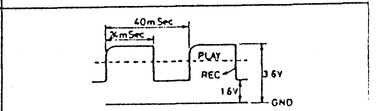
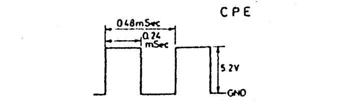
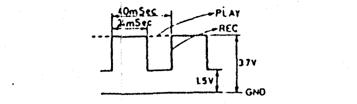
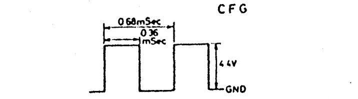
**❶**
VHR-3500EX


J04
F04
F03
J05
F02
L01
L03
L05
C09
FR531Z12
FT531Z25
TN-1
T01
AFT
L02
L04
T02
VIDEO
R22
C26
J03
D01
C24
C14
VR01 AGC
F01
J02
T03 FTZ
C16
C25
Q04
C12
Z12
J01
B C E
LOCATION. NO. 6001-

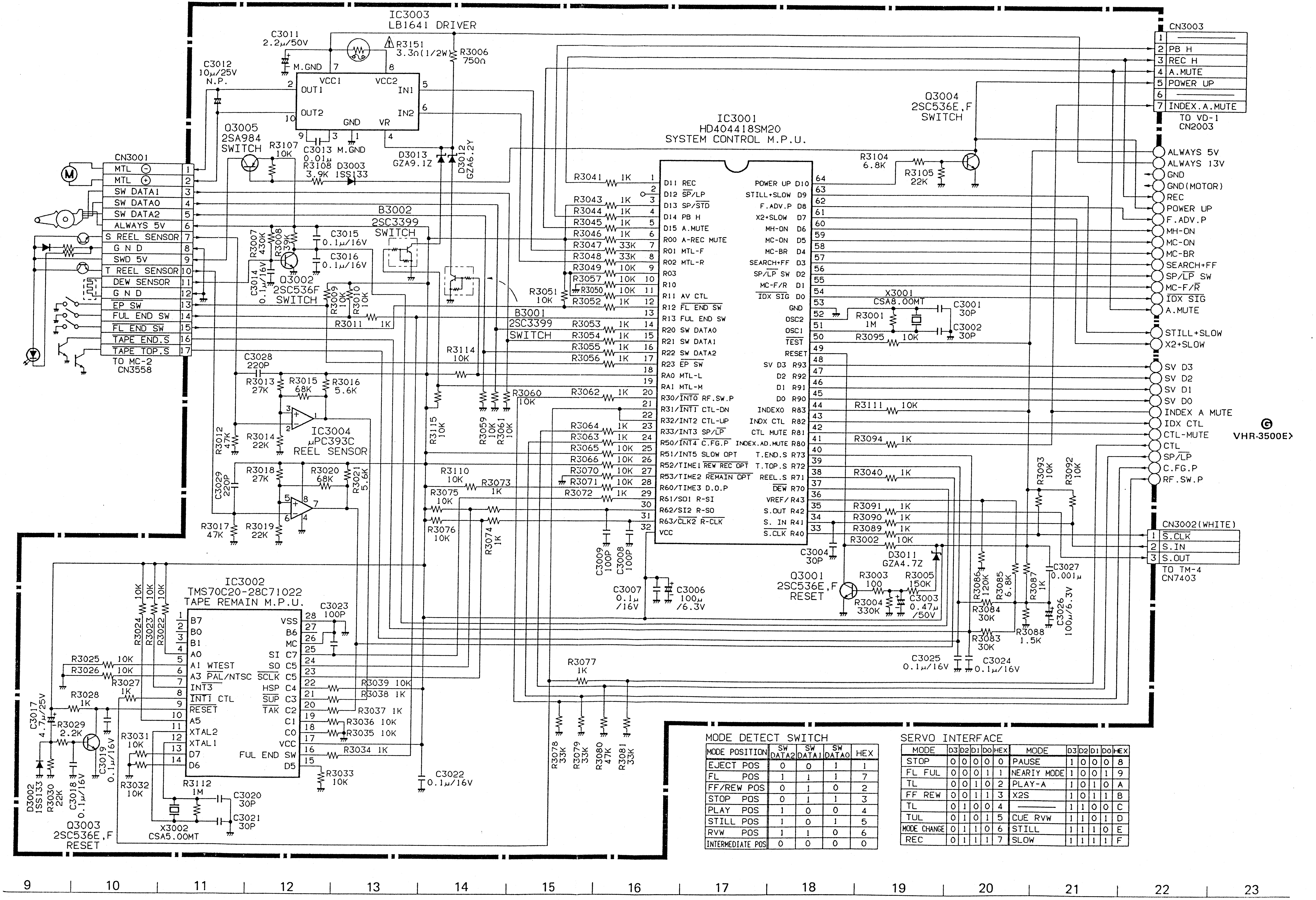

CN7405
KEY IN 3
92
91
GND
TO TM-5 CN7001


CN7001
KEY IN 3
92
91
GND
TO TM-4 CN7405

## WAVEFORM OF SERVO

| IC 4001 (LA7413-8034) | | | | IC 4004 (4053) | |
|---|---|---|---|---|---|
| ① |  | ㉜ |  | ② |  |
| ② |  | ㉟ |  | ③<br>④ |  |
| ⑦ |  | IC 4002 (LA7117) | | ⑤ |  |
| ⑧ |  | ① |  | ⑪<br>⑭ |  |
| ⑨ |  | ② |  | IC 4005 (BA236A) | |
| ⑩ |  | ③ |  | ② |  |
| ⑪ |  | ⑮ |  | ③ |  |
| ⑫ |  | ⑰ |  | ④ |  |
| ⑬ |  | ⑲ |  | Q 4002 | |
| ⑭<br>⑮ |  | ⑳ |  | B |  |
| ⑰ |  | ㉒ |  | C |  |
| ⑱ |  | ㉓ |  | Q 4005 | |
| ⑲ |  | ㉖ |  | D |  |
| ⑳ |  | ㉗ |  | G |  |
| ㉒ |  | IC 4003 (BA718) | | S |  |
| ㉓ |  | ⑥⑦<br>⑧ |  | | |
| ㉕<br>㉖ |  | | | | |

# P.C.B. SY-1 SYSTEM CONTROL CIRCUIT (143-0-233V-53600)


IC3003
LB1641 DRIVER
C3011
2.2μ/50V
M.GND
R3151
3.3Ω(1/2W)
R3006
750Ω
VCC1
VCC2
OUT1
IN1
OUT2
IN2
GND
VR
C3012
10μ/25V
N.P.
C3013 M.GND
0.01μ
R3108 D3003
3.9K 1SS133
Q3005
2SA984
SWITCH
R3107
10K
D3013
GZA9.1Z
D3012
GZA6.2Y
CN3001
MTL ⊖
MTL ⊕
SW DATA1
SW DATA0
SW DATA2
ALWAYS 5V
S REEL SENSOR
G N D
SWD 5V
T REEL SENSOR
DEW SENSOR
G N D
EP SW
FUL END SW
FL END SW
TAPE END.S
TAPE TOP.S
TO MC-2
CN3558
C3007 430K
R3008 39K
C3015
0.1μ/16V
C3016
0.1μ/16V
Q3002
2SC536F
SWITCH
C3014
0.1μ/16V
B3002
2SC3399
SWITCH
R3009 10K
R3010 10K
R3011 1K
B3001
2SC3399
SWITCH
R3114
10K
R3051
10K
C3028
220P
R3013
27K
R3015
68K
R3016
5.6K
IC3004
μPC393C
REEL SENSOR
R3012
47K
R3014
22K
R3115
10K
R3059 10K
R3061 10K
R3060
10K
C3029
220P
R3018
27K
R3020
68K
R3021
5.6K
R3017
47K
R3019
22K
R3110
10K
R3073
1K
R3075
10K
R3076
10K
R3074
1K
IC3001
HD404418SM20
SYSTEM CONTROL M.P.U.
R3041 1K
R3043 1K
R3044 1K
R3045 1K
R3046 1K
R3047 33K
R3048 33K
R3049 10K
R3057 10K
R3050 10K
R3052 1K
R3053 1K
R3054 1K
R3055 1K
R3056 1K
R3062 1K
R3064 1K
R3063 1K
R3065 10K
R3066 10K
R3070 10K
R3071 10K
R3072 1K
D11 REC
D12 SP/LP
D13 SP/STD
D14 PB H
D15 A.MUTE
R00 A-REC MUTE
R01 MTL-F
R02 MTL-R
R03
R10
R11 AV CTL
R12 FL END SW
R13 FUL END SW
R20 SW DATA0
R21 SW DATA1
R22 SW DATA2
R23 EP SW
RA0 MTL-L
RA1 MTL-M
R30/INT0 RF.SW.P
R31/INT1 CTL-DN
R32/INT2 CTL-UP
R33/INT3 SP/LP
R50/INT4 C.FG.P
R51/INT5 SLOW OPT
R52/TIME1 REW REC OPT
R53/TIME2 REMAIN OPT
R60/TIME3 D.O.P
R61/SO1 R-SI
R62/SI2 R-SO
R63/CLK2 R-CLK
VCC
POWER UP D10
STILL+SLOW D9
F.ADV.P D8
X2+SLOW D7
MH-ON D6
MC-ON D5
MC-BR D4
SEARCH+FF D3
SP/LP SW D2
MC-F/R D1
IDX SIG D0
GND
OSC2
OSC1
TEST
RESET
SV D3 R93
D2 R92
D1 R91
D0 R90
INDEX0 R83
INDX CTL R82
CTL MUTE R81
INDEX.AD.MUTE R80
T.END.S R73
T.TOP.S R72
REEL.S R71
DEW R70
VREF/ R43
S.OUT R42
S. IN R41
S.CLK R40
X3001
CSA8.00MT
C3001
30P
C3002
30P
R3001
1M
R3095 10K
R3104
6.8K
R3105
22K
Q3004
2SC536E,F
SWITCH
R3111 10K
R3094 1K
R3040 1K
R3091 1K
R3090 1K
R3089 1K
R3002 10K
R3093 10K
R3092 10K
C3004
30P
D3011
GZA4.7Z
Q3001
2SC536E,F
RESET
R3003
100
R3005
150K
R3004
330K
C3003
0.47μ
/50V
R3086 120K
R3085 6.8K
R3087 1K
R3084
30K
R3083
30K
R3088
1.5K
C3027
0.001μ
C3026
100μ/6.3V
C3025
0.1μ/16V
C3024
0.1μ/16V
C3009 100P
C3008 100P
C3007
0.1μ
/16V
C3006
100μ
/6.3V
CN3003
PB H
REC H
A.MUTE
POWER UP
INDEX.A.MUTE
TO VD-1
CN2003
ALWAYS 5V
ALWAYS 13V
GND
GND(MOTOR)
REC
POWER UP
F.ADV.P
MH-ON
MC-ON
MC-BR
SEARCH+FF
SP/LP SW
MC-F/R
IDX SIG
A.MUTE
STILL+SLOW
X2+SLOW
SV D3
SV D2
SV D1
SV D0
INDEX A MUTE
IDX CTL
CTL-MUTE
CTL
SP/LP
C.FG.P
RF.SW.P
CN3002(WHITE)
S.CLK
S.IN
S.OUT
TO TM-4
CN7403
IC3002
TMS70C20-28C71022
TAPE REMAIN M.P.U.
R3024 10K
R3023 10K
R3022 10K
B7
B0
B1
A0
A1 WTEST
A3 PAL/NTSC
INT3
INT1 CTL
RESET
A5
XTAL2
XTAL1
D7
D6
VSS
B6
MC
SI C7
SO C5
SCLK C5
HSP C4
SUP C3
TAK C2
C1
C0
VCC
FUL END SW
D5
C3023
100P
R3039 10K
R3038 1K
R3037 1K
R3036 10K
R3035 10K
R3034 1K
R3033
10K
C3022
0.1μ/16V
R3025 10K
R3026 10K
R3027
1K
R3028
1K
C3017
4.7μ/25V
R3029
2.2K
C3019
0.1μ/16V
R3031
10K
R3032
10K
R3112
1M
C3020
30P
C3021
30P
X3002
CSA5.00MT
D3002
1SS133
R3030
22K
C3018
0.1μ/16V
Q3003
2SC536E,F
RESET
R3077
1K
R3078 33K
R3079 33K
R3080 47K
R3081 33K
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

MODE DETECT SWITCH

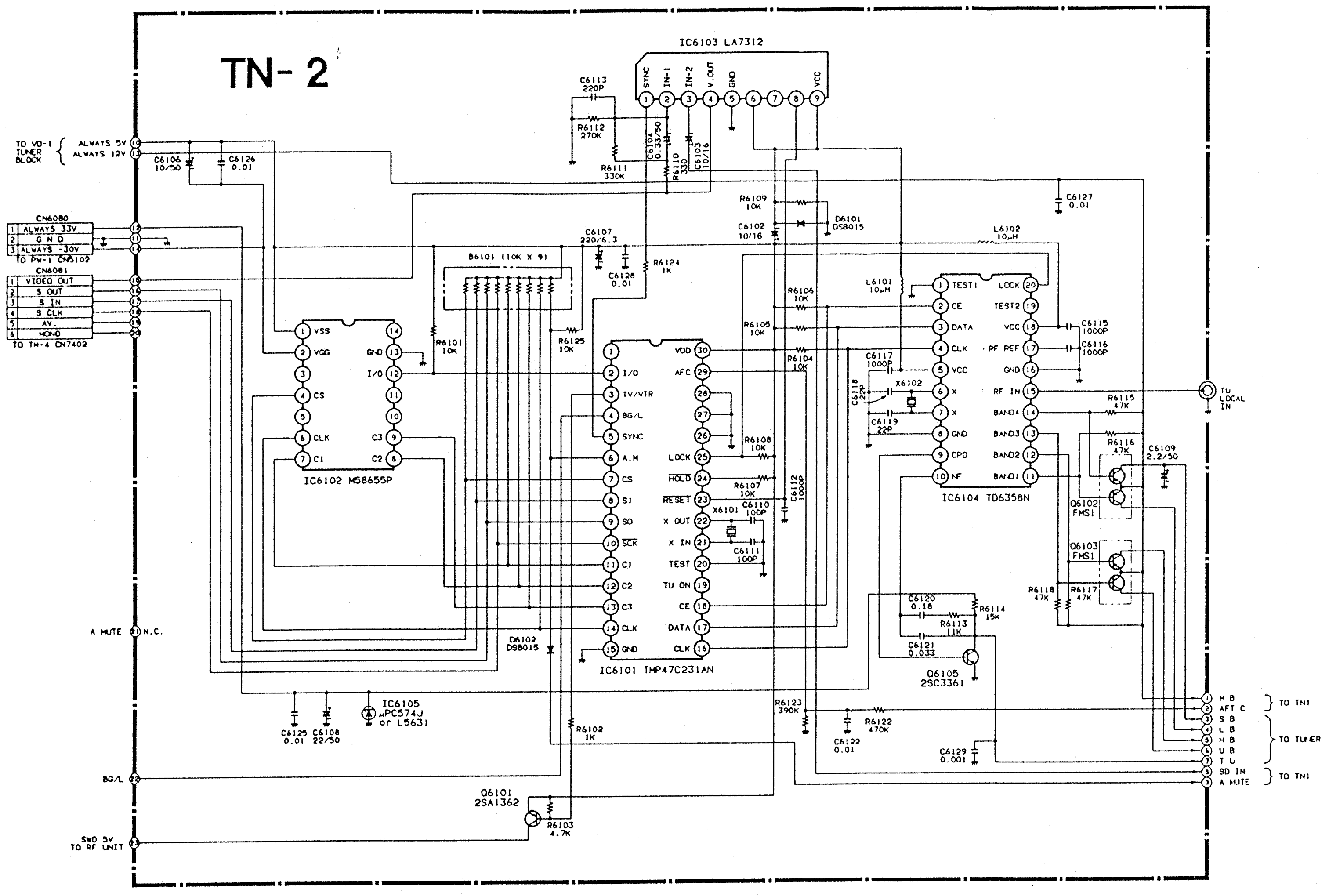
| MODE POSITION | SW DATA2 | SW DATA1 | SW DATA0 | HEX |
|---|---|---|---|---|
| EJECT POS | 0 | 0 | 1 | 1 |
| FL POS | 1 | 1 | 1 | 7 |
| FF/REW POS | 0 | 1 | 0 | 2 |
| STOP POS | 0 | 1 | 1 | 3 |
| PLAY POS | 1 | 0 | 0 | 4 |
| STILL POS | 1 | 0 | 1 | 5 |
| RVW POS | 1 | 1 | 0 | 6 |
| INTERMEDIATE POS | 0 | 0 | 0 | 0 |

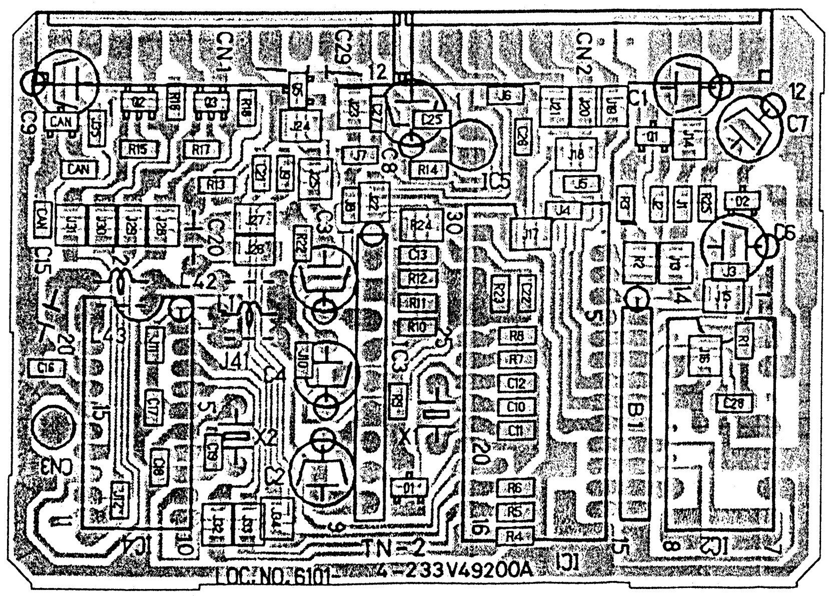
SERVO INTERFACE

| MODE | D3 | D2 | D1 | D0 | HEX | MODE | D3 | D2 | D1 | D0 | HEX |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STOP | 0 | 0 | 0 | 0 | 0 | PAUSE | 1 | 0 | 0 | 0 | 8 |
| FL FUL | 0 | 0 | 0 | 1 | 1 | NEARIY MODE | 1 | 0 | 0 | 1 | 9 |
| TL | 0 | 0 | 1 | 0 | 2 | PLAY-A | 1 | 0 | 1 | 0 | A |
| FF REW | 0 | 0 | 1 | 1 | 3 | X2S | 1 | 0 | 1 | 1 | B |
| TL | 0 | 1 | 0 | 0 | 4 | ——— | 1 | 1 | 0 | 0 | C |
| TUL | 0 | 1 | 0 | 1 | 5 | CUE RVW | 1 | 1 | 0 | 1 | D |
| MODE CHANGE | 0 | 1 | 1 | 0 | 6 | STILL | 1 | 1 | 1 | 0 | E |
| REC | 0 | 1 | 1 | 1 | 7 | SLOW | 1 | 1 | 1 | 1 | F |

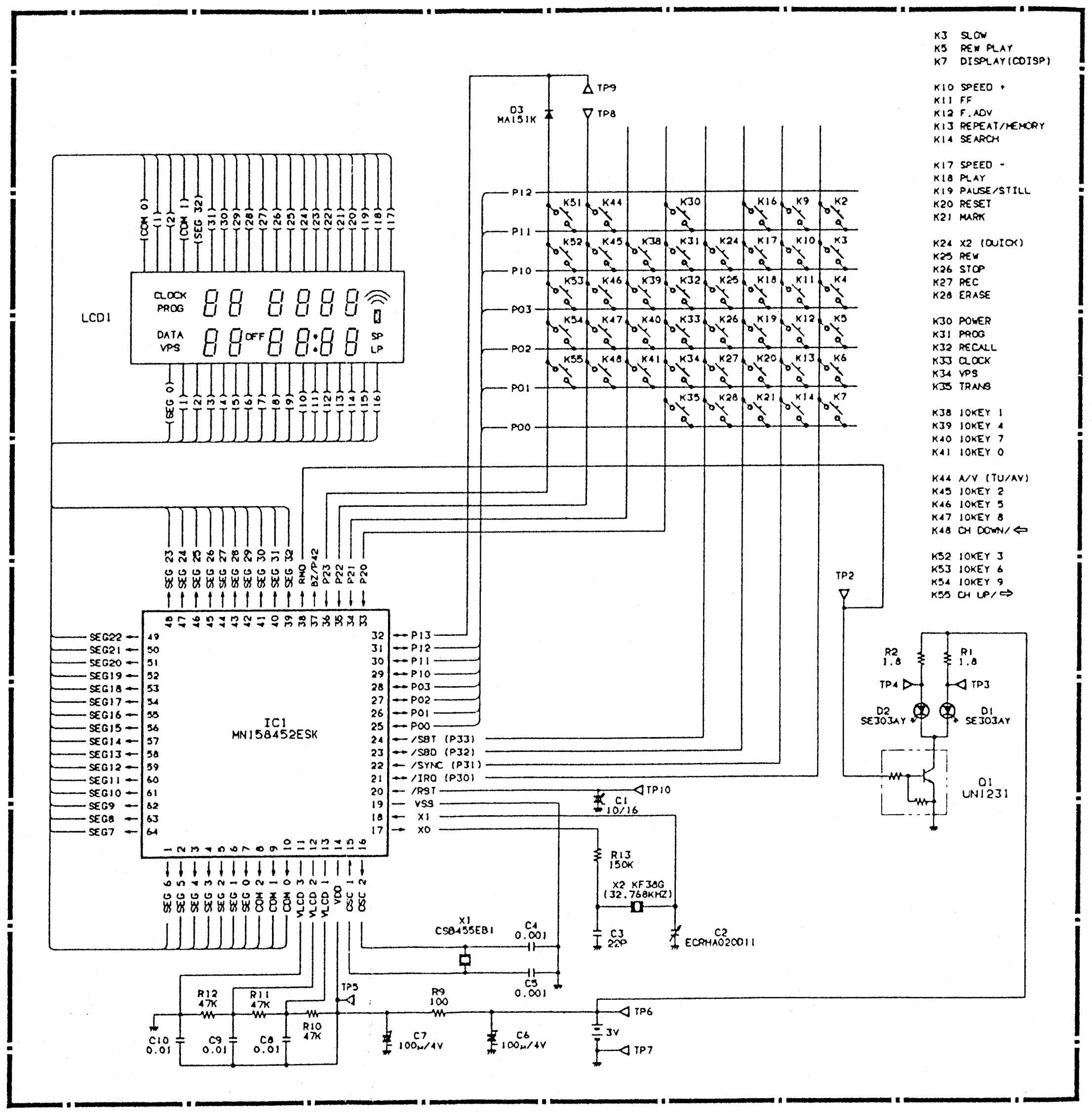
Ⓖ
VHR-3500E

## P.C.B. TN-2 TUNING CONTROL CIRCUIT & P.C.B. (143-0-233V-49221)


TN- 2
IC6103 LA7312
IC6102 M58655P
IC6101 TMP47C231AN
IC6104 TD6358N
IC6105 μPC574J or L5631
Q6101 2SA1362
Q6105 2SC3361
Q6102 FMS1
Q6103 FMS1
B6101 (10K X 9)
X6101
X6102
TO VD-1 TUNER BLOCK
ALWAYS 5V
ALWAYS 12V
CN4080
ALWAYS 33V
GND
ALWAYS -30V
TO PW-1 CN5102
CN4081
VIDEO OUT
S OUT
S IN
S CLK
AV
MONO
TO TN-4 CN7402
TU LOCAL IN
TO TN1
TO TUNER
TO TN1
A MUTE
BG/L
SWD 5V TO RF UNIT


TN-2
LOC.NO.6101
4-233V49200A
CN1
CN2
CND

## IR REMOTE CONTROL CIRCUIT (143-0-4100-68901)


K3 SLOW
K5 REW PLAY
K7 DISPLAY(CDISP)
K10 SPEED +
K11 FF
K12 F.ADV
K13 REPEAT/MEMORY
K14 SEARCH
K17 SPEED -
K18 PLAY
K19 PAUSE/STILL
K20 RESET
K21 MARK
K24 X2 (QUICK)
K25 REW
K26 STOP
K27 REC
K28 ERASE
K30 POWER
K31 PROG
K32 RECALL
K33 CLOCK
K34 VPS
K35 TRANS
K38 10KEY 1
K39 10KEY 4
K40 10KEY 7
K41 10KEY 0
K44 A/V (TU/AV)
K45 10KEY 2
K46 10KEY 5
K47 10KEY 8
K48 CH DOWN/ ⇦
K52 10KEY 3
K53 10KEY 6
K54 10KEY 9
K55 CH UP/ ⇨
LCD1
IC1 MN158452ESK
X1 CSB455EB1
X2 KF38G (32.768KHZ)
Q1 UN1231
D1 SE303AY
D2 SE303AY
D3 MA151K
3V

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18